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GALLSTONE OBSTRUCTION

PATHOGENESIS AND ROENTGEN MANIFESTATIONS

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The recognition of the specific nature of an obstructing lesion of the bowel is a vastly important expedient in the proper management of intestinal obstruction. With the introduction of suction therapy for the treatment of acute obstruction by Wangensteen and Paine,¹ the need for exact diagnosis has become even more pressing. While it is clear that in certain cases simple mechanical obstruction of the small bowel can be treated successfully without recourse to surgery, the management of obstruction of the small bowel by decompression is not without danger, especially when the exact nature of the lesion has not been ascertained. In certain instances of diagnostic uncertainty, suction decompression of the bowel postpones the inevitable train of events and creates a false sense of security. Gallstone ileus is one of the conditions in which temporizing procedures are not indicated; once this diagnosis is established, the hazard of any procedure other than surgical intervention is well recognized.

From our own experience with gallstone obstruction, as well as from the impression gained from reported cases, it appears clear that, in most instances, an exact diagnosis of dynamic ileus due to gallstones can be determined by means of roentgen examination.

The isolated reported cases in which a preoperative diagnosis of gallstone obstruction has been made are far outnumbered by the decisions emanating from the surgical or even from the autopsy table. It is not surprising to note mortality statistics which range from 33 to 93 per cent and which average close to 50 per cent, since delay in diagnosis has long been recognized as the important cause of poor results in the treatment of intestinal obstruction. It is our opinion that the almost total failure of specific diagnosis in gallstone

obstruction prior to 1930, with the correspondingly high mortality, can be converted to a reasonably high percentage of accurate diagnoses with an inevitable improvement in the recovery rate.

INCIDENCE

The number of recognized cases of intestinal obstruction due to gallstones has been indicated by various authors as ranging from 0.4 per cent to 5 per cent² of all cases of bowel obstruction. It may be stated with certainty that the range of frequency suggested is an absolute minimum; the actual incidence will probably always remain the subject of speculation.

The pathogenesis and anatomic connections of internal fistulas have been described in some detail in a previous paper.³ Gallstones may enter the intestinal tract in one of two ways: through an internal biliary fistula or through the common duct. Erosion through the wall of the gallbladder or other parts of the biliary tract is produced by the necrotizing action of a stone, which process is in turn usually related to biliary obstruction and increased intraluminal tension. Abscess formation with adhesions and final fistula formation permit entrance of the stone into the bowel. Stones large enough to obstruct the bowel almost always enter by means of a true internal biliary fistula.

Cholecystogastric, cholecystoduodenocolic, cholecystojejunocolic and choledochocolic fistulas are relatively rare and are associated with gallstone obstruction very infrequently.

It has been well established that the most frequent connection of internal biliary fistula due to gallstones is with the duodenum, resulting in a cholecystoduodenal communication. While much is written as to the pathologic nature of such a process, it is rare that we are fortunate enough to encounter the onset of this fistulous formation at the autopsy table. A characteristic example of such an instance is the specimen shown in figures 1 and 2 which was removed at autopsy by Dr. Frank Andrus of the Minneapolis General Hospital, through whose courtesy it is here illustrated. A large stone present in the gallbladder may be seen eroding through the wall of the viscus, which was closely adherent to the first portion of the duodenum. The erosion has already extended into the lumen of the duodenum itself, so that the stone can be made out through the opened duodenum. The mechanism of the development of a fistula between the gallbladder and the first portion of the duodenum is well demonstrated in this specimen.

¹ Before the Section on Radiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

² Owing to lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

³ From the Department of Radiology and Physical Therapy of the University of Minnesota, the Departments of Roentgenology of the University Hospital and the Minneapolis General Hospital, and the Department of Pathology of the Ancker Hospital, St. Paul.

1. Wangensteen, O. H., and Paine, J. R.: The Early Diagnosis of Acute Intestinal Obstruction with Comments on Pathology and Treatment: With a Report of Successful Decompression of Three Cases of Mechanical Bowel Obstruction by Nasal Catheter Suction Siphonage, West. J. Surg. 40: 1-17 (Jan.) 1932.

2. Schwarke, R.: Ueber zweimaligen Gallensteinileus, Zentralbl. f. Chir. 65: 1980-1985 (Sept. 3) 1938. Wakeley, C. P. B., and Willway, F. W.: Intestinal Obstruction by Gallstones, Brit. J. Surg. 23: 377-394 (Oct.) 1935.

3. Borman, C. N., and Rigler, L. G.: Spontaneous Internal Biliary Fistula and Gallstone Obstruction, Surgery 1: 349-378 (March) 1937.

Next in frequency to the cholecystoduodenal type, as a source of gallstone obstruction, is the choledochoduodenal fistula. We have been able to study a patient at autopsy, following accidental death, in whom three stones measuring together 3.5 by 7 cm. had passed through the major portion of the common duct but apparently could not traverse the sphincter itself. As a result an erosion of the wall at the distal portion of the duct into the second portion of the duodenum was actively progressing toward the formation of a choledochoduodenal fistula (fig. 3). The common duct was massively dilated; when the duodenum was opened the duct could be seen invaginated into the bowel. The ampulla is seen to be elevated and appears tightly closed, while erosion of the walls of the common duct and the duodenum, preliminary to the extrusion of these large stones into the intestine, has occurred. This specimen illustrates well the massive size of stone which may pass through the duct into the duodenum and the mechanism whereby this process takes place.

It is notable that while the stone filled the entire duct down to the ampulla, the effort to pass it was being made through an entirely new orifice rather than through the ampulla itself. Microscopic examination of the major papilla and dissection of the ducts by Dr. E. A. Boyden⁴ of the department of anatomy revealed the following findings:

The lowest stone, which occupied the distended major papilla, had not entered the short undistended ampulla of Vater but was being held by hypertrophied bands of muscle representing the lowest fibers of the sphincter choledochus—that portion of the sphincter of Oddi which surrounds the intramural segment of the common bile duct. As a result of this obstruc-

diameter. By contrast, the ampulla remained narrow and only a few millimeters in length, and its sphincter was only moderately developed.

Whether a stone entering the bowel through the ampulla of the common duct can produce obstruction still remains a matter of conjecture. Wakefield, Vickers

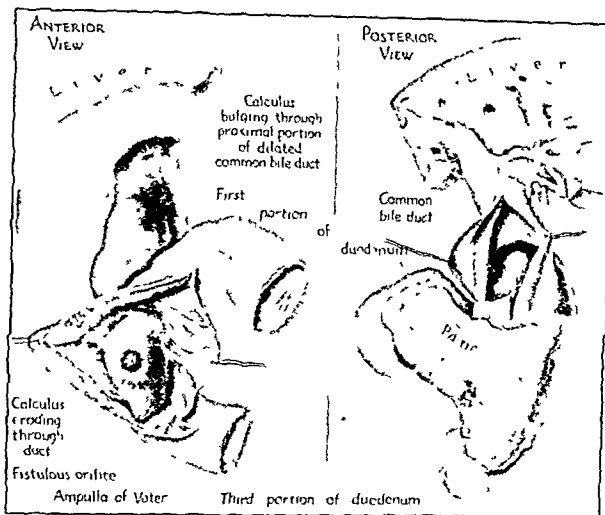


Fig. 3—Drawing of autopsy specimen taken from a patient in whom a choledochoduodenal fistula was developing from stones in the common duct. The anterior view shows the duodenum opened to exhibit the enormously dilated common duct invaginating into it. Note the ampulla of Vater tightly closed and the erosion in the wall of the duct and duodenum, where the calculus can be seen penetrating through. The posterior view shows the opened duct with the stones within it.

and Waters,⁵ for example, had never seen such a case. Courvoisier,⁶ however, stated that in 7 of 35 cases of gallstone obstruction the route taken by the stone was through the duct itself. In one of these cases the common duct was dilated to the size of the gallbladder and in another a stone 4 inches (10 cm.) in circumference had negotiated the duct and had resulted in obstruction of the bowel. Synder⁷ recently reported an unrecognized case of gallstone obstruction in which the cystic and common ducts and the ampulla were all dilated to such an extent that the index finger could easily be passed into the duodenum, yet no true fistula was present. From an examination of the literature it would appear that regurgitation of contrast material through the common duct as a result of a patent ampulla occurs about as frequently as the demonstration of choledochoduodenal and cholecystocolic fistulas. Nevertheless, there is a question as to whether most of the reported cases of communication through the orifice of the common duct are not in fact choledochoduodenal fistulas located near the end of the duct.

The possibility of error in this regard is well illustrated in figure 4, a case of choledochoduodenal fistula. Barium sulfate given by mouth is shown to extend through an opening between the first portion of the duodenum and the common duct. The distal portion of the duct is also filled with contrast material, but the distal end is tightly closed so that the barium regurgitates into the gallbladder and biliary radicles. If the spontaneous anastomosis itself were not clearly demonstrable here, this case might well have passed for one of regurgitation through the ampulla into the common duct.

5. Wakefield, E. E.; Vickers, P. M., and Walters, W. Intestinal Obstruction by Gallstones, *Surgery*, 5: 670-673 (May) 1939.
6. Courvoisier, L. G. *Chirurgisch-statistische Beiträge zur Pathologie und Chirurgie der Gallenwege*, Leipzig, F. C. W. Vogel, 1870.
7. Synder, L. H. Unrecognized Gallstone Obstruction of the Intestine, *South. M. J.* 31: 1275-1276 (Dec) 1938.



Fig. 4—Specimen removed at autopsy from a patient in whom a cholecystoduodenal fistula was developing, the duodenum opened from behind showing perforation 1, calculus, 2, perforation of duodenal wall; 3, duodenum, 4, caudate lobe, 5, quadrate lobe.

tion the stones had telescoped the biliary portion of the major papilla until it reached a length of 3.5 cm. In this process the minor papilla had been drawn out onto the major papilla and the narrow slit through which the ducts normally enter the duodenum had been enlarged to an oval window 3.2 cm. in

It can be stated with considerable certainty that most stones producing occlusion enter the small bowel directly from the fundus of the gallbladder. Stones entering the colon directly seldom produce frank obstruction and are usually passed by the rectum. The important feature as concerns the present discussion is that a direct opening is established between the biliary and the intestinal tract. This abnormal connection is vastly important in the detection of the pathologic process that has preceded it since, with the exception of the relatively infrequent primary ulcerating bowel or biliary lesions, gallstones are the essential etiologic factor. Regurgitation of air or barium through the fistula into the biliary radicles permits visualization of the biliary tree because of the contrast between the liver tissue and the bile ducts.

Once a calculus has entered the intestinal tract, obstruction results if the foreign body is too large to pass the lumen of the bowel. Varying degrees of obstruction or intermittent ileus occur owing to irritation of the bowel wall and secondary spasm, even when the stone is not large enough to occlude the lumen completely. The prime factor in obstruction, however, is the presence of the stone, and the further the progress through the small bowel the greater the probability of intestinal occlusion. Only rarely does obstruction occur at as high a level as the duodenum, and in the majority of instances the terminal ileum is the final site of impaction.⁹ Naturally, the exact situation of the impaction depends, in large measure, on the size of the stone. In spite of isolated reports of unusually large stones being passed spontaneously, most writers on the subject agree¹⁰ that a stone measuring more than 25 mm. in diameter is not likely to pass through the small bowel without producing symptoms. The physical characteristics of the stone, as well as its size, require consideration, since a small stone with sharp edges can produce local irritation to the bowel wall and obstruction may be the result of spasm alone.³ In a case reported by Hinchey,¹¹ the first stone which was passed spontaneously was of greater weight and diameter than the second, which caused obstruction. The finding of a faceted stone implies the distinct possibility of the presence of a second stone, for which a search should be made. Recurrent obstruction due to a second stone during immediate convalescence has been reported in 7 instances, according to Hinchey;¹¹ Schmutzler,¹² who has likewise stressed the significance of finding a faceted stone, removed a second stone during the same operation but only after exploring the bowel above the site of the first stone.

CLINICAL CHARACTERISTICS

The clinical features of gallstone ileus have contributed little to the exact diagnosis. On the contrary, they are almost always misleading, and the confusing picture so frequently presented throws the burden of proof onto a more exacting method of diagnosis. Probably 75 per cent of the patients are women over 60 years of age. A certain percentage present a long history of intermittent gallbladder attacks preceding the acute phase, but the antecedent history of others is

devoid of biliary implication. The symptoms produced by the presence of the stone in the bowel prior to complete obstruction are of such character that they mask the picture. Some of the difficulties encountered in the clinical consideration of such patients are well demonstrated in the cases reported here.

ROENTGEN DIAGNOSIS

In a review of the literature previous to the year 1935 we were able to find but 7 cases of gallstone obstruction which had been diagnosed preoperatively by means of roentgen examination.³ Since that time we have found reports of 24 cases, including those previously reported by us, that have been diagnosed gallstone ileus and wherein the roentgen appearance was the main factor in the specificity of the diagnosis. Nevertheless numerous reports still appear, even at the present date, wherein the nature of the obstructing

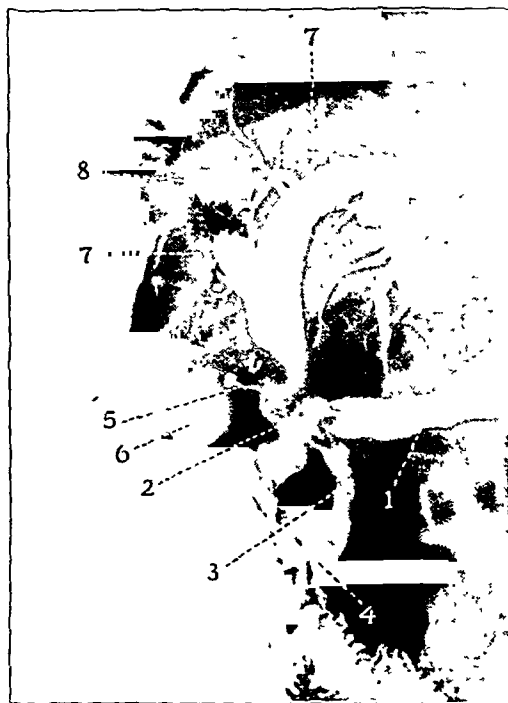


Fig. 4.—Spontaneous internal biliary fistula demonstrated by barium meal. 1, stomach; 2, anastomosis between common duct and duodenum; 3, common duct; 4, closed distal end of duct; 5, cystic duct; 6, gallbladder; 7, hepatic ducts; 8, gas in hepatic duct.

lesion has only rarely¹³ or even never¹⁴ been determined before operation and wherein roentgen examination if employed at all has been confined largely to a "flat plate" of the abdomen for the purpose of confirming the diagnosis of intestinal obstruction.

The influence of roentgen examination, not only on the exact diagnosis in gallstone obstruction but on the accompanying mortality, is exemplified in a report by Petren¹⁵ from the University of Lund in Sweden. In

9. Adamesteanu, C., and Dimitru, C.: Gallensteinileus in Verbindung mit Darminvagination, *Zentralbl. f. Chir.* 66: 2112-2116 (Sept. 23) 1939.

10. Kommerell, Burkhard, and Engel, Rudolf: Zur Diagnose des Gallensteinileus, *Klin. Wchnschr.* 17: 1680-1684 (Nov. 26) 1938.

11. Hinchey, P. R.: Recurrent Gallstone Ileus, *New England J. Med.* 223: 174-179 (Aug. 1) 1940.

12. Schmutzler, E.: Gallensteinileus und Röntgenbild, *Zentralbl. f. Chir.* 65: 1195-1200 (May 21) 1938.

13. Balch, F. G.: Gallstone Ileus, *New England J. Med.* 218: 457-462 (March 17) 1938. Dulin, J. W., and Peterson, F. R.: Intestinal Obstruction Due to Gallstones, *Arch. Surg.* 38: 351-357 (Feb.) 1939 Dean.¹¹

14. Flinn, J. M.: Intestinal Obstruction at Terminal Ileum Caused by a Large Irregular Gallstone, *Am. J. Roentgenol.* 44: 69-70 (July) 1940. Matusek, Bela: Ueber Darmverschluss durch Gallensteine, *Beitr. z. klin. chir.* 169: 129-135, 1939. Schwarke.²

15. Petren, Gustaf: Ueber Gallensteinileus, unter besonderer Berücksichtigung seiner Röntgendiagnostik, *Chirurg* 11: 278-291 (April 15) 1939.

all 7 cases observed from 1910 to 1924 the result was postoperative fatality. From 1928 to 1939 7 cases were encountered in all of which the roentgen examination was the important feature of the diagnosis and there was only 1 death. The early determination of the probable need for surgical intervention results in the treatment of choice in most cases, namely prompt operation. As already mentioned, not only is early specific diagnosis of gallstone ileus quickly reflected in the mortality from this disease but it is of great significance in determining what part, if any, suction decompression should play in its management.

Although Wangenstein¹⁶ stated that in some instances suction will accomplish decompression and permit extrusion of the stone, he warned against the danger of procrastinating in the case of obstruction due



Fig 5 (case 1).—Roentgenogram of abdomen in supine position. 1, dilated gas filled loops of small bowel; 2, gas in stomach; 3, gas in gallbladder; 4, gas in biliary ducts. The combination of signs of intestinal obstruction with evidences of internal biliary fistula, as shown by the gas in the biliary tract, made the diagnosis of gallstone obstruction possible.

to gallstones. Persistence of intestinal distention as revealed by roentgen examination after a trial with suction indicates the necessity for operation at the earliest possible moment. Many surgeons believe that immediate operation should be done without any particular trial of suction and, at this time, Wangenstein is also of this opinion. Accordingly, if the diagnosis of gallstone ileus is specified, there are well defined limits for the use of suction; in most instances prompt surgical intervention before damage to the bowel wall and its sequelae have appeared is the best procedure.

16. Wangenstein, O. H.: *The Therapeutic Problem in Bowel Obstruction: A Physiological and Clinical Consideration*, Springfield, Ill., Charles C. Thomas, Publisher, 1937.

ROENTGEN SIGNS

The roentgen examination in cases of intestinal obstruction from a gallstone may reveal any or all of the following signs:

1. Air or contrast medium in the biliary tract.
2. Direct visualization of the stone or indirect visualization of the stone by means of contrast medium in the intestine.
3. Change in position of a previously observed stone.
4. The roentgen evidences of partial or complete intestinal obstruction.

The recognition of air or contrast medium in the biliary system will, in our opinion, indicate the nature of the obstructing lesion in a higher percentage of cases than by any other single sign. In 2 cases of gallstone obstruction previously reported by us,³ this was the first direct roentgen sign noted; in Petren's series,¹⁵ in 6 of the last 7 cases wherein the exact diagnosis had been made by roentgen examination, the biliary radicles were visualized. In the literature in 22 of 36 cases of gallstone obstruction in which roentgen examination had been made, the biliary radicles were visible in the roentgenogram. Not infrequently this sign was present on the preoperative films but was not identified or recognized until after operation. Gallstones that have entered the gastrointestinal tract and which are large enough to produce obstruction practically always leave a pathway behind them permitting reflux of intestinal content. Obviously reflux of gas is the common sign found, as the administration of contrast substances, such as barium sulfate, is usually contraindicated.

Films made in both the anteroposterior and postero-anterior projections, centered over the right upper quadrant, are of greater value in eliciting this sign than are films centered over the midabdomen. The fact that no other special procedure is necessary for the demonstration of gas in the bile ducts adds greatly to the value of the finding. Usually the lower portion of the biliary tree alone is visible, and therefore the relationship of the linear or circumscribed markings to the duodenal loop is particularly important. A classic example of the roentgen findings in a spontaneous internal biliary fistula, without intestinal obstruction, has already been illustrated in figure 4. The hepatic duct and its branches are filled with gas as well as barium. Another illustration of contrast medium in the biliary tract in association with obstruction is shown in figure 8, while gas alone in the biliary tract is shown in figures 5, 6 and 7.

Because a biliary fistula tends to obliterate itself by scar formation, the absence of air in the bile ducts cannot be considered as completely eliminating the possibility of gallstone obstruction.

Regurgitation of contrast material through what has been termed "an incompetent common duct sphincter" has been observed in the presence of a stone lodged in the lower end of the common duct, and in a case of carcinomatous metastasis producing a high jejunal obstruction.¹⁸ However, the proof of an incompetent sphincter and the absence of a fistula has not been offered. Åkerlund¹⁹ and Case²⁰ have demonstrated

18. McArthur, L. L.: Repair of the Common Bile Duct, *Tr. Am. S. A.* 41: 1-18, 1923. Venables, J. F., and Briggs, P. J.: Visualization of Bile Ducts After an Opaque Meal, *Guy's Hosp. Rep.* 70: 123-126 (Jan.) 1929.

19. Åkerlund, Åke: Duodenaldivertikel und gleichzeitige Erweiterung des Vaterischen Divertikels bei einem Fall von Pankreatitis, *Fortschr. a. d. Geb. d. Röntgenstrahlen* 25: 540, 1919.

20. Case, J. T.: Roentgen Observation on the Duodenum with Special Reference to the Lesions Beyond the First Portion, *Am. J. Roentgenol.* 3: 314-326 (June) 1916.

barium in the distal ends of the ducts in cases of chronic pancreatitis. Indurating, usually malignant lesions adjacent to the common duct are known to have permitted reflux.²¹ Emphysematous cholecystitis and cholangitis incident to infections of the biliary tract with gas forming organisms²² may rarely produce gas in the ducts. With these possible and rare exceptions the presence of contrast material or gas in the biliary tract is synonymous with fistula formation. Accordingly, the demonstration of air or barium in the bile ducts in association with intestinal obstruction (fig. 5) practically excludes any consideration other than occlusion from a gallstone.

In a certain percentage of cases, especially when clinical signs point to the possibility of gallstone ileus and when careful search is made, the stone will be directly seen in the roentgenogram of the abdomen (fig. 7). Unless considerable calcification and lamellation are present, the calculus may well escape detection, especially when the obstruction has resulted in fluid and gaseous distention of the bowel. Similarly, in such instances, the administration of barium as an aid in detection is not a recommended procedure, although it may occasionally be given in error, as in case 4. As already indicated, biliary calculi are most likely to be found in the region of the terminal ileum. The postero-anterior projection is the position of choice. In our experience, when the stone shadow is apparent the bile ducts are usually also seen, while the contrary is not true. The determination, before surgical exploration, of the quadrant occupied by the stone and its relative position in the small intestine facilitates removal with a minimum of trauma.

The disappearance of previously demonstrated gallstones or, more especially, detection of the same shadows of gallstones in the lower part of the abdomen following previous observation in the right upper quadrant is of distinct diagnostic value. However, the utilization of this sequence of events must be considered unusual as well as fortunate. In 1 of our previously reported cases our suspicion was first aroused by the failure to see a group of stones which had been quite evident during a previous examination. A similar finding was obtained in case 4 of this series. The presence of a demonstrable stone in the gallbladder which is faceted but without a sister stone may be sufficient to arouse suspicion, but it is only suggestive. Such a situation is illustrated in case 2 (fig. 6).

The roentgen evidences of intestinal obstruction are obviously also to be found. It should be noted, however, that characteristic distention of loops of the small bowel may not be demonstrable because the obstruction may be partial or intermittent. In most cases, however, the classic distention of several loops of the small bowel with gas, the unusual visibility of the small intestinal segments and the relative absence of gas in the colon may be observed. Careful study of the films will reveal the presence of the normal peritoneal markings and the absence of any free gas or fluid in the peritoneal cavity; such findings tend to militate against the diagnosis of peritonitis.

Sosman^{22a} has suggested that the perforation of a duodenal ulcer into the gallbladder, when accompanied by paralytic ileus, may produce roentgen findings closely

simulating those of gallstone obstruction. We have never encountered this problem.

For the purposes of this study 404 cases of intestinal obstruction of all types were reviewed. Among these there were 11 cases of undoubted gallstone obstruction in 10 of which a reasonably adequate roentgen examination of the abdomen had been made. In addition, we have observed 4 other cases of proved gallstone obstruction. In all of the 14 cases examined there were reasonably good roentgen signs of intestinal obstruction; in all but 1 there were evidences of gas or contrast medium in the biliary tract (figs. 5 and 6). The calculus was directly demonstrable (fig. 7) in 4 cases and showed a change in position from its previously known site in 2 cases. In 1 case the calculus produced a defect in the barium-filled intestinal shadow

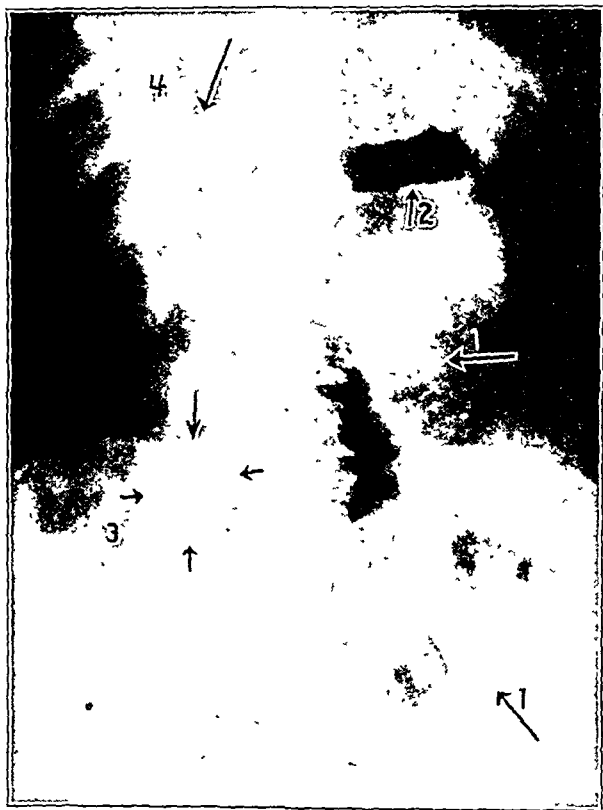


Fig. 6 (case 2).—Roentgenogram of abdomen in supine position, 1, dilated loops of intestine filled with gas; 2, gas in the stomach; 3, shadow of impacted stone with facet on upper surface (this was not observed before operation); 4, faceted stone in gallbladder with gas above it, extending into biliary ducts. Presence of gas in the biliary tract, the remaining faceted stone in the gallbladder and evidences of intestinal obstruction permitted the exact diagnosis of gallstone obstruction.

(fig. 8). In 2 cases additional stones were visible in the gallbladder. It should be noted that the diagnosis was not made in all these cases from the roentgen examination, but the failure to make the correct diagnosis was not due to the absence of the signs in the roentgenogram but rather to failure to detect the signs because of unfamiliarity with the syndrome.

REPORT OF CASES

In order to illustrate the characteristic features of this condition 4 cases from this group are reported in some detail:

CASE 2.—A woman aged 62 was admitted to the University Hospital complaining of abdominal crampy pains, nausea and vomiting of two days' duration. The pain began in the mid-

21. Rees, C. E.: Duodenocolic Fistula with Incompetent Sphincter of Oddi, *J. A. M. A.* **100**:496-497 (Feb 18) 1933.

22. Berg, H. H.: Zur Strahlendiagnostik der Leber, *Ztschr. f. Klin. Med.* **135**:562-571, 1939. Schmidt, E. A.: Emphysematous Cholecystitis and Pericholecystitis, *Radiology* **31**:423-427 (Oct.) 1938.

22a. Sosman, M. C.: Personal communication to the authors.

abdomen, radiated indefinitely to the back and was associated with nausea and vomiting. There had been no bowel movements for three days. In the past twelve hours, however, her condition had improved considerably, and the pain had disappeared.

Physical examination on admission revealed little evidence of distention, tenderness or spasm and no bowel sounds could

obstruction could be made from the first film, despite the absence of any very remarkable distention of the small bowel. It is notable that in the last twelve hours before entrance the patient had become distinctly better. This is typical of many cases of gallstone obstruction and is one of the characteristics of the symptomatology of this condition.

The single roentgenogram of the abdomen (fig. 6) revealed the evidences of intestinal obstruction, the remaining stone in the gallbladder and gas in the biliary tract. Careful study of the film after the operation revealed the large impacted stone in the ileum. This shadow, however, was so faint that it probably could not have been recognized without certain knowledge of its presence. The facet on its superior surface could also be identified.

The disappearance of the stone remaining in the gallbladder without any evidence of it becoming obvious by the patient's condition indicates the ease with which smaller stones may be passed.

CASE 3—A woman aged 75 was admitted to St. Andrew's Hospital complaining of pain in the right upper quadrant, abdominal colic and vomiting, all of which had been present for one week. The past history was of no significance. The physical examination suggested dynamic intestinal obstruction.

With the latter in mind, we performed duodenal suction and instituted intravenous administration of chlorides, with good symptomatic relief.



Fig 7 (case 3)—Roentgenogram of abdomen in supine position. 1, loops of small bowel distended with gas; 2, gas and suction tube in stomach; 3, laminated dense shadow characteristic of gallstone in right lower quadrant; 4, gas in biliary ducts. The stone is here directly visualized together with the evidences of intestinal obstruction and of an internal biliary fistula.

be made out. The clinical impression was that this was a subsiding cholecystitis.

The roentgen examination of the abdomen (fig 6) showed only two small loops of bowel distended with gas. A typical faceted gallstone could be made out in the region of the gallbladder, and above this an area characteristic of gas was clearly shown. The finding of intestinal distention, faceted gallstone and the presence of gas in the gallbladder led to a definite diagnosis of gallstone obstruction.

Shortly after this some evidence of extrarenal uremia appeared, duodenal suction was started and surgical exploration was undertaken by Dr. O. H. Wangenstein.

When the abdomen was opened a gallstone 3.5 by 3.5 by 3 cm, smoothly faceted at each end, was found in the ileum on the right side of the abdomen. This was removed by enterotomy and the intestine closed.

Reexamination with roentgenograms of the abdomen two weeks after the operation showed the gallstone previously observed in the gallbladder to have disappeared. Although the stools were examined, this stone was never recovered, but repeated roentgen examinations thereafter indicated that it undoubtedly had passed during convalescence.

The deceptive character of the symptoms of this patient is illustrated by the fact that she was seen by two members of the resident staff on her entrance, neither of whom thought that she had intestinal obstruction or any illness of serious consequence. Yet on roentgen examination the exact diagnosis of gallstone



Fig 8 (case 4)—Roentgenogram of abdomen in prone position, following administration of barium enema and barium meal. 1, barium in the stomach; 2, barium in the colon; 3, gas in distended loops of small bowel; 4, barium in severely distended loops of small bowel; 5, barium and gas extending into biliary ducts from fistula; 6, barium surrounding gallstone in small bowel. In this instance the diagnosis of gallstone obstruction could be made from the direct evidence of an internal biliary fistula, direct evidence of intestinal obstruction and the indirect visualization of the stone itself.

A simple roentgenogram of the abdomen with the patient supine was made at the bedside two days later. This revealed distended loops of small bowel, a laminated dense shadow in the left side of the pelvis resembling a gallstone and a few

areas of lessened density over the liver, indicating gas in the biliary ducts. Reexamination the following day (fig. 7) exhibited the same conditions except that the gallstone had moved somewhat to the right.

Abdominal exploration was carried out by Dr. Charles Hallberg. Near the distal portion of the ileum was found a gallstone measuring 3 cm. in diameter completely occluding the bowel. The mucosa was ulcerated and perforation was impending. The calculus was removed by enterotomy and the patient made an uneventful recovery.

This case presents three of the roentgen signs of gallstone obstruction, namely gas in the biliary ducts, visible gallstone in the lower part of the abdomen and signs of intestinal obstruction. Not only was the exact diagnosis established by roentgen examination but the position of the stone was localized, permitting a surgical approach with a minimum of effort. From the appearance of the bowel it seemed clear that perforation might have occurred if surgical therapy had been further delayed.

CASE 4.—A woman aged 70 was admitted to the University Hospital following a minor accident. She had had a long history of cholecystitis and cholelithiasis; there were various other complaints over a period of many years, none of which were closely related to the present condition. Roentgen examination six years earlier had revealed multiple large stones in the gallbladder.

About three weeks before entrance the patient had had an accident and injured her back. Roentgen examinations of the spine and pelvis gave essentially negative results. She came in at this time complaining of pain in the back for which she was kept under observation. There were also evidences of mental deterioration. Two days later she complained of abdominal pain and had some vomiting, but for the next two days the patient was fairly comfortable. On the day of the operation there was some tenderness in the abdomen and the patient was complaining of nausea and distention. Because of the numerous complaints which she had made in the past, the history of accident and her mental state, the clinical impression was that there was no real pathologic condition of the abdomen.

Intestinal obstruction was not considered, but because of the possibility of some lesion of the digestive tract roentgen examination of the colon with a barium enema and of the gastrointestinal tract with barium meal was undertaken. A significant distention of the loops of small bowel was observed (fig. 8) and within a loop of the ileum a defect was apparent. The shadow of the gallstone was no longer visible in the right upper quadrant. The extension of the barium into a fistula communicating with the biliary tract and some gas in the biliary ducts served to demonstrate conclusively the entire diagnosis, namely gallstone obstruction, with a large stone in the bowel surrounded by barium and an internal biliary fistula.

Surgical exploration of the abdomen was undertaken and the distended loops of small bowel were demonstrated. A stone measuring 3.5 by 3 by 3 cm., one surface of which was smoothly faceted, was found about 20 cm. from the ileocecal valve, where it was impacted. It was removed by enterotomy, the small bowel was closed and the patient made an uneventful recovery.

This case was extraordinary in view of the high degree of obstruction despite symptoms which were insufficient to indicate a serious clinical condition. The giving of barium was, of course, an error, although in this instance it apparently produced no ill results. The demonstration of a gallstone as a defect in the barium shadow is illustrated in this particular case. In addition there were the disappearance of previously observed shadows of stones in the gallbladder area, the presence of barium in the internal biliary fistula, gas in the bile ducts and roentgen evidences of intestinal obstruction

SUMMARY

1. Two cases were observed at autopsy in which the manner of development of a choledochoduodenal and a cholecystoduodenal fistula could be demonstrated.

2. The specific signs which permit a roentgenologic diagnosis of this condition are evidences of dynamic ileus, presence of gas or contrast medium in the biliary tract and direct or indirect visualization of the calculus.

3. In 13 of 14 cases of gallstone obstruction in which roentgen examination was made, the exact diagnosis could have been made from the roentgenograms alone.

4. It is important to recognize the exact nature of an obstructing lesion of the bowel in order to determine whether suction therapy or immediate surgery should be undertaken.

5. Because gallstone obstruction is an indication for immediate intervention, every effort should be made to recognize its characteristic roentgen signs.

ABSTRACT OF DISCUSSION

DR. JAMES T. CASE, Chicago: I have always been skeptical about gallstones passing through the natural channels. I have seen undoubted gallstones that patients claimed had passed and I have always insisted that they must have passed through some spontaneous fistula. I have had several personal cases in which gallstones were passed through fistulous openings later demonstrated in the opened abdomen. I am glad to note that Drs. Rigler, Borman and Noble voice an objection to the general unselected use of suction therapy. I think I see a tendency to employ that method in all cases of ileus, whereas there are conditions in which it should not be used. The method of passage of the stone from the gallbladder into the lumen of the digestive tube has been strikingly illustrated by the authors. There are 2 of my cases of special interest in which a gallstone passed in this manner. In 1 the stone passed from the gallbladder into the stomach, and the calculus was so large that it could not get through the pylorus. It was recognized on my gastrointestinal study as a foreign body free in the stomach, and operation showed that it was a gallstone and that it had passed into the stomach through a spontaneous cholecystogastrostomy. In the other one a gastroenterostomy had been performed previously. A spontaneous cholecystocolostomy and a spontaneous cholecystoduodenostomy occurred, and a gallstone which lay in the duodenum was found when an operation was performed later. In the study of suspected acute intestinal obstruction we should not be content to depend on the gas shadows in the intestine to the exclusion of the use of opaque materials. I know that there are many who feel that it is objectionable to introduce barium or bismuth in any form into the digestive tube in the presence of suspected obstruction. But there is now available a means which I myself have employed for a number of years; namely, the oral administration of the aqueous solution of thorium dioxide, which can be given to any patient without any fear of complications. It will enable one to visualize safely the small intestine even in the face of obstruction. Within four hours one can get good visualization, especially if it is given very cold and if the patient is kept recumbent on the right side in bed to facilitate the evacuation of stomach contents.

DR. LEO G. RIGLER, Minneapolis: There is no doubt, as Dr. Case said, that stones will pass through the intestinal tract without interference, but the risk in waiting for them to pass spontaneously is so great that it should not be undertaken. I should like to reemphasize that the history in gallstone obstruction is very often unreliable. The combination of signs that I have described and with which every one, I am sure, is familiar, namely gas in the biliary ducts plus the evidences of intestinal obstruction, is practically specific regardless of whether or not the stone can be seen. In our experience it is much more specific and much more reliable than either the history or the physical findings in this particular type of intestinal obstruction.

ANESTHESIA FOR SURGERY ABOUT
THE HEADURBAN H. EVERSOLE, M.D.
BOSTON

This discussion is not intended as an exhaustive treatment of the subject of anesthesia for surgery about the head but rather as a discussion of some of the technical problems with which the anesthesiologist is confronted when an operation is to be performed in this region of the body. In addition, a detailed description of two methods of administering anesthesia for surgery about the head is to be presented. These methods have been developed in an attempt to meet certain requirements which are important and to overcome some of the difficulties that are frequently encountered during the course of anesthesia for operations in this region of the body.

There are many factors that the anesthesiologist must consider if he is to select the proper anesthetic agent and method of its administration for any type of surgery. Some of these factors have a peculiar significance when the operation is to be performed in the region of the head. Some of the more important of these may be considered under one of the following heads: (1) proper preparation of the patient for operation, (2) selection of the proper agent, (3) employment of a method of administering this agent that will insure an adequate and unobstructed airway at all times, (4) facilities readily available for the treatment of respiratory and circulatory depression, (5) an anesthetic technic which will in no way hamper the work of the surgeon, (6) precautions against explosion when inflammable anesthetic agents are being used and (7) adequate protection for the patients' eyes.

Since this discussion deals primarily with the technical management of anesthesia for operations about the head, no detailed consideration will be given to the preparation of the patient for operation. Obviously, there should be an adequate preoperative general physical examination, with a careful estimation of the surgical risk. Not only the choice of anesthesia but often the choice and magnitude of the operation is affected by a proper appreciation of the hazards which may be presented by the patient's condition. In addition, adequate preoperative treatment will often favorably affect certain serious physical conditions which may be present.

Essentially the same rules apply to the selection of preoperative medication for patients who are to have some type of operation about the head as apply when the operation is to be performed in any other part of the body. Proper attention should be paid to drug idiosyncrasies, age, sex and the physical condition of the patient. It must be borne in mind that the respiratory mechanism may be seriously upset in patients who have increased intracranial pressure or in any patient during the course of intracranial surgery. For this reason, any drug which may cause respiratory depression should be used cautiously in patients with increased intracranial pressure or on whom any type of intracranial operation is to be performed.

In the selection of the proper anesthetic agent for any type of surgical procedure, the question of adequate oxygen, as well as the explosion hazard, must be considered. Unsupplemented nitrous oxide and oxygen is the only commonly used inhalation anesthetic mixture

that is entirely noninflammable. Since nitrous oxide is such a weak anesthetic agent that it does not permit the administration of sufficient oxygen to allow for the maintenance of anesthesia without some degree of anoxia, this agent is seldom used unsupplemented. Of course, the addition of ether or cyclopropane as a supplemental agent makes the mixture inflammable. Ethylene shares with cyclopropane and ether the property of being explosive and, in addition, shares with nitrous oxide the property of being so weak as not to permit the administration of sufficient oxygen with it to guarantee freedom from anoxia at all times. Both ether and cyclopropane are sufficiently potent as anesthetic agents to permit the administration of oxygen in amounts large enough to insure adequate oxygen, regardless of the depth of anesthesia. It therefore becomes quite evident that safeguards against an explosion in the operating room when an inhalation anesthetic is being used take on the nature of precautions rather than the use of nonexplosive agents. The danger of explosion is greatly increased when the surgeon uses a high frequency electrosurgical unit for removal of tissue or for coagulating bleeding vessels. High frequency currents may cause induced electrical charges to be built up on other pieces of apparatus or on the patient with the consequent danger of a spark, in addition to the obvious point of danger where the cutting or coagulating point comes in contact with the tissue. The only danger that is presented by the low voltage actual cautery is that of the glowing end of the cautery itself. The low voltage actual cautery or the high frequency coagulating apparatus should not be used in or around the mouth when inflammable anesthetics are being used. In addition, the high frequency apparatus should not be used at all if cyclopropane or ether vapor and oxygen is being administered, as with the carbon dioxide absorption technic. When any type of electrosurgical apparatus or cautery is to be used, ether vapor and air is probably much safer than ether vapor and oxygen and is certainly safer than cyclopropane and oxygen. Experiments done by Dr. J. W. King of the Massachusetts Institute of Technology have shown that no mixture of ether and air will explode with the violence that some mixtures of ether and oxygen do. Neither will any mixture of ether and air explode with the violence that all explosive mixtures of cyclopropane and oxygen will.¹ In addition, further precautions should be taken, such as placing a screen between all anesthetic connections and the operative field, and the delivery of the exhaled gases at a point several feet from the site of operation. Even though ether vapor and air is less explosive than ether vapor and oxygen, this must not be taken to indicate that this mixture is entirely free from the hazard of explosion.

One of the shorter acting barbiturates such as pentothal or evipal administered intravenously is quite satisfactory for operations that will probably not exceed thirty minutes in length. Obviously, the use of this method of anesthesia eliminates all the dangers of explosion.

One of the most important factors to be considered in the management of any type of anesthesia is the maintenance of an adequate and unobstructed airway at all times. This is particularly important for any type of surgery about the head. For this reason an endotracheal tube should be in place before any extensive surgery is begun in this region of the body. However, the mere presence of an endotracheal tube is not in

From the Department of Anesthesia, the Labey Clinic.
Read before the Section on Anesthesiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. King, J. W.: Personal communication to the author.

itself a guaranty that the patient will have an adequate respiratory exchange. A method of administration should be employed that will not only permit the anesthetist to observe the depth and character of the patient's respirations but also enable him to render effective treatment should any marked degree of respiratory

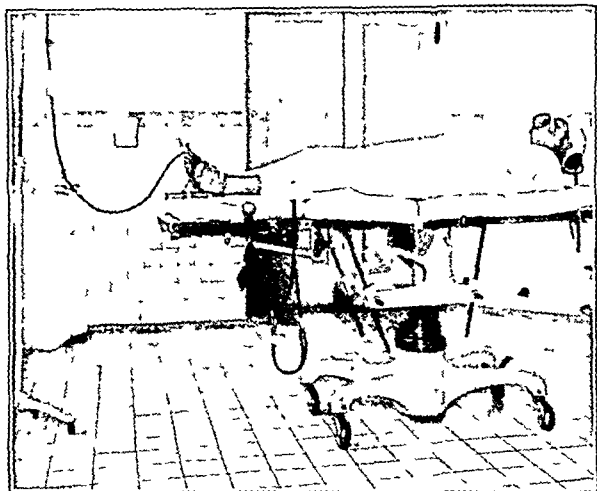


Fig 1—Patient with apparatus in position for administration of intermittent intravenous anesthesia, with nasal endotracheal tube in place

depression become manifest. During the course of intracranial surgery, particularly in the posterior fossa, marked disturbances of respiration are not at all uncommon. The anesthetist must be on the alert for signs of disturbed respiration and should have facilities immediately available to carry out artificial respiration for an indefinite length of time should it be necessary.

The problem of circulatory depression presented by patients on whom operations about the head are performed in no way differs from the problem of circulatory depression presented when an operation is performed in any other region of the body. When a long or shocking surgical procedure is anticipated, or if during the course of any surgical procedure there is considerable blood loss or evidence of impending shock, a continuous intravenous drip of fluid should be started. This affords a means of replacing fluid and is also a route for the administration of blood should a transfusion be necessary. In the actual treatment of shock there is no fluid that is as valuable as whole blood. If this is not immediately available, a 5 or 10 per cent solution of dextrose in distilled water may be used. The use of physiologic solution of sodium chloride in the treatment of low blood pressure and shock is probably of only transitory value. Adrenergic drugs such as epinephrine, neosynephrin, ephedrine and pitressin are occasionally indicated. At best their action is only temporary and they should be used only in an emergency to support a failing circulation until intravenous fluid and transfusion can be instituted.

Another important factor which may easily be neglected in the management of patients on whom operations in the region of the head and face are performed is the protection of the eyes. A serious keratitis which may even result in an opacity of the cornea may develop from an injury to the eye during an operation. Extreme care should be taken to prevent irritating agents such as iodine and alcohol from getting in the eyes. Furthermore, safeguards should be taken to prevent drapes from being forced down against the eyeball. Even in the absence of an irritating agent, if an eye is left open

during the course of an operation a rather serious keratitis may develop as a result of the drying of the cornea. If the draping is such that the anesthetist cannot readily see the eyes at all times, they may be protected by filling them with boric acid ointment and covering with gutta percha which is molded firmly into position by means of a sponge soaked in hot water. This is an excellent method for the protection of the eyes of patients suffering from exophthalmos.

A fundamental principle which should guide the anesthesiologist in planning anesthesia for any type of operation is that he should so devise and place his apparatus that it in no way hampers the work of the surgeon. It should be an almost invariable rule that the surgeon should not have to modify his technic or hamper himself for room to work in order that the anesthetist may use a particular piece of apparatus. Anesthesia is sufficiently flexible and there is available a large enough variety of drugs and methods to enable an anesthesiologist, even without an unusual amount of ingenuity, to devise methods whereby he can safely and adequately maintain anesthesia for an almost unlimited length of time without, so to speak, getting in the surgeon's way.

In view of some of the technical problems mentioned earlier in this discussion, anesthesia for surgery about the head can be roughly classified under three main heads: (1) operations of short duration (thirty minutes or less) in which the development of any degree of respiratory difficulty is quite unlikely, (2) operations of longer duration during which the surgeon will not use any type of high frequency surgical apparatus or the actual cautery and (3) operations of longer duration during which either the actual cautery or some type of high frequency coagulating apparatus may be used.

For surgical procedures which are superficial and will probably not require more than thirty minutes to complete, one of the shorter acting intravenous barbiturates, such as pentothal or evipal, has proved quite satisfactory. These may be administered in a 5 per cent solution or, as suggested by Lundy and his associates,² a 2.5 per cent solution offers less chance of delayed phlebitis or, if some of the solution is inadvertently injected outside the vein, there is less danger of severe tissue reaction. The apparatus described by

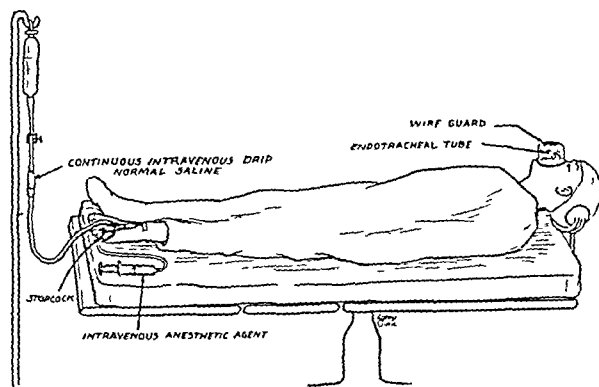


Fig 2—Diagrammatic sketch of apparatus shown in figure 1

Nicholson and Sise³ for the administration of intravenous anesthetic agents has been quite satisfactory and has the advantage of being simple and inexpensive.

2. Lundy, J. S.; Tuohy, E. B.; Adams, R. C., and Mousel, L. H. Annual Report for 1938 of the Section on Anesthesia. Including Data on Blood Transfusion, Proc. Staff Meet., Mayo Clin 14: 273-284 (May 3) 1939.

3. Nicholson, M. J., and Sise, L. F.: Pentothal Sodium Anesthesia for Encephalography, New England J. Med 222: 994-996 (June 13) 1940.

This apparatus consists of a thick walled rubber tube, about 1 foot in length, with a stopcock and glass adapter on one end for the needle and a metal adapter for the syringe on the other end. The needle can be placed directly in the vein or, if an intravenous drip apparatus is already in place, it may be shunted into the system by means of a Y connection. It should be borne in mind

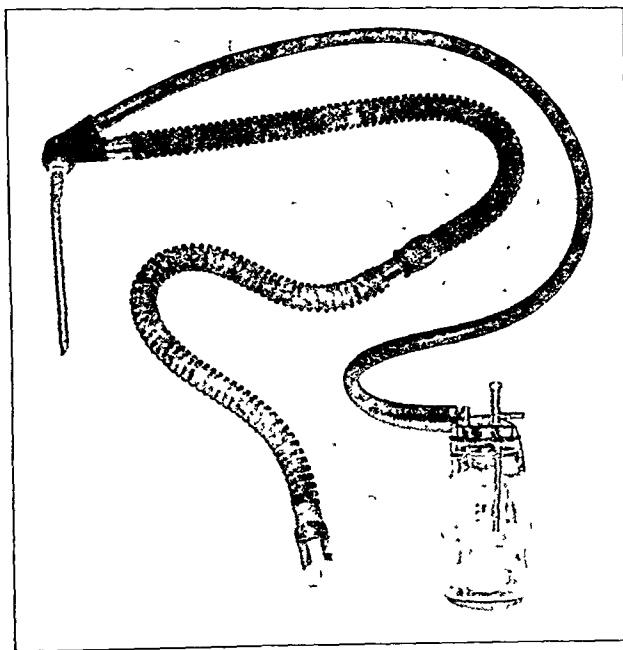


Fig 3—Apparatus for the administration endotracheally of ether vapor and air. Note respiratory indicator over end of exhalation tube. Ether chamber illustrated is a Richardson bottle

that a precipitate may be formed if pentothal is added to dextrose solution. If this drug is to be added to an intravenous drip, the intravenous fluid should be physiologic solution of sodium chloride.

Except for short procedures (ten minutes or less) an endotracheal tube should be inserted when intravenous anesthesia is employed for surgery about the head. The patient is first anesthetized with a small amount of the barbiturate solution and the throat is then carefully sprayed with a 10 per cent solution of cocaine. Great care should be taken to spray the epiglottis and larynx. The tip of the atomizer should then be passed down between the vocal cords, and the inside of the trachea sprayed with the cocaine solution. A rubber endotracheal tube of the Magill type is now passed through the nose into the trachea and secured in place by a small piece of adhesive tape. Some sort of frame should now be placed over the end of the tube and held in position by means of adhesive tape to hold the drapes away from the end of the tube, where they might form an obstruction. An ordinary ether mask of the Yankauer type is very satisfactory for this purpose (figs. 1 and 2). This method has the disadvantage of not permitting any type of artificial respiration other than manual pressure on the chest wall and for this reason should not be employed when respiratory difficulties are anticipated. On the other hand, this method does have the advantage of not presenting any explosion hazard.

For longer operations, during which the surgeon will not use any type of high frequency electrical apparatus or cautery, cyclopropane or cyclopropane in combination with ether or ethylene administered by the carbon dioxide absorption technic is preferable. With the use

of a circle type filter for carbon dioxide absorption the inhalation and exhalation tubes may be extended as far as desired, in order to allow the anesthetist to keep well away from the operative field, without any danger of building up a carbon dioxide concentration that would be harmful to the patient. In addition, there is no necessity for a bulky piece of apparatus near the patient's head which might be in the surgeon's way.

When this method is used it is desirable to have a snug fit of the endotracheal tube into the trachea so that all of the patient's respirations will be carried out through the tube. For this purpose an inflatable rubber cuff of the type described by Guedel and Waters⁴ is very satisfactory. If an inflatable rubber cuff is not available; the same purpose can be accomplished by packing moist gauze which has been impregnated with surgical lubricant tightly around the endotracheal tube. This method has the disadvantage of increasing the hazard of aspiration of vomitus, should the patient vomit while the apparatus is in place.

For longer procedures during the course of which the surgeon is likely to use some type of high frequency electrical apparatus or the actual cautery, ether vapor and air is probably safer from the standpoint of explosion than cyclopropane-oxygen or ether vapor and oxygen.¹

For the administration of ether vapor and air, over long periods of time, a semiopen type of apparatus may be used. The objectives in mind when this apparatus was designed were (1) an adequate airway at all times, (2) ether vapor mixed with air, (3) delivery of the exhaled gases at a point several feet away from the site of operation, (4) elimination of all danger of building up increased pressure in the lungs and (5) a method affording a simple and easy way of administering artificial respiration. This apparatus consists of (1) a source of compressed air, (2) a chamber for the vaporization of ether, (3) rubber tubing at least $\frac{1}{2}$ inch in diameter

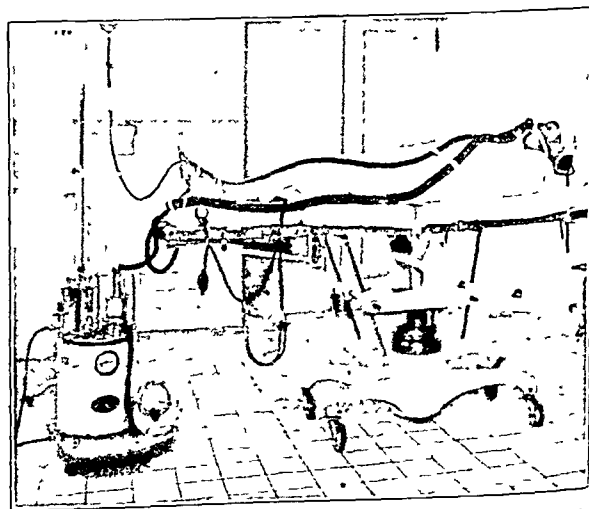


Fig 4—Patient with apparatus in place for the administration endotracheally of ether vapor and air. Ether chamber illustrated is a Connell anestheticometer. Note respiratory indicator over end of exhalation tube and intravenous drip for the administration of fluid.

and long enough to reach from the patient's head to the ether vaporizer at the foot of the table, for the delivery of the ether vapor laden air to the patient, (4) a V shaped connection for attachment of the inhaling and exhaling tubes to the hilt of the endotracheal tube, (5)

4 Guedel, A. E., and Waters, R. M.: A New Intratracheal Catheter. *Anesth. & Analg.* 7: 238 239 (July-Aug.) 1928

an endotracheal tube, (6) a large caliber exhaling tube and (7) a wisp of cotton or small piece of tissue paper to act as a respiratory indicator over the end of the exhaling tube (fig. 3).

The most satisfactory source of compressed air is from a jet in the operating room with a compressor and storage tank elsewhere in the hospital. However, if this

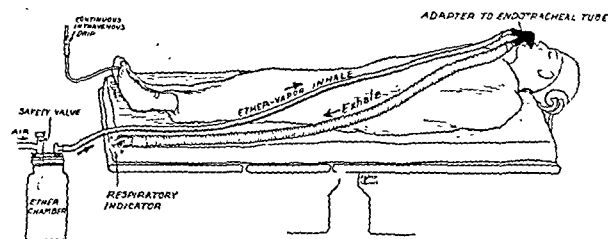


Fig. 5.—Diagrammatic sketch of apparatus shown in figure 4.

is not available, a motor or foot pump may be used if they will deliver greater than approximately 12 liters of air a minute. In addition, air that has been compressed into large cylinders may be used, although this method is obviously quite expensive. The chamber for the vaporization of ether should be so designed that varying portions of the air can be shunted over the ether without varying the volume of flow to the patient. A useful apparatus for the administration of varying concentrations of ether vapor in the inspired air is the Connell anesthetometer.⁵ This is a semiautomatic apparatus which is very efficient in the maintenance of a relatively level plane of ether anesthesia. This apparatus is calibrated so that the concentrations of ether vapor delivered to the patient may be read off directly in millimeters of mercury partial pressure of ether vapor.

A much less expensive apparatus for the vaporization of ether is the so-called Richardson bottle,⁶ which costs only a small fraction of the price of the anesthetometer. Although it is not nearly so automatic as the anesthetometer, this apparatus has proved satisfactory, and with a little experience one may become proficient in maintaining an even plane of anesthesia with it. With the Richardson bottle, ether is contained in an ordinary Ball-Mason fruit jar. The lid of the jar is so designed that a constant flow of air can be maintained through it, and by means of a screw setting variable amounts of the air may be allowed to pass over the ether. With the anesthetometer there is a rheostat controlled electric plate for heating the ether vapor. With the Richardson bottle the ether vapor is heated by merely setting the jar in a basin of warm water.

It is important that the tubes leading to and from the endotracheal catheter are of rather large caliber in order that there may be no difficulty in delivering a sufficient amount of air to satisfy the patient's tidal respiration, and that there may be no resistance to expiration. Any of the commonly used types of endotracheal tubes may be employed. The flexible metal tube described by Woodbridge⁷ is satisfactory.

The respiratory indicator on the distal end of the exhalation tube is important. By watching its movements the anesthetist may obtain considerable information as to the character of the respirations. Furthermore, this respiratory indicator serves to inform the anesthetist

when the flow of air delivered to the patient is less than his respiratory volume. When this is true the patient will inhale from the exhaling tube and draw the indicator into the end of the tube. When this occurs it should be immediately corrected, since a flow of air less than the patient is breathing results in his breathing back and forth into the exhaling tube, thus building up carbon dioxide and, in addition, anoxia may develop. As long as an adequate flow of air is maintained there is practically no limit to the length to which the inhalation and exhalation tubes may be extended, thus enabling the anesthetist to be well out of the field of operation and yet be able to observe enough of the vital signs to evaluate adequately the patient's condition (figs. 4 and 5).

The semiopen type of apparatus just described is well adapted for artificial respiration. If the anesthetist's hand is placed over the end of the exhalation tube at intervals of about fifteen times a minute the air pressure will inflate the lungs, while the weight of the chest wall will take care of expiration. A safety valve in the circuit calibrated to open when 12 mm. of mercury pressure is reached obviates the danger of building up too much pressure in the lungs with this method of artificial respiration. When the semiopen method is to be used, the patient is first anesthetized with cyclopropane or ethylene and the transition to ether gradually made. After a depth of anesthesia has been reached that will permit the introduction of an endotracheal tube with facility, the larynx and trachea are sprayed with a 10 per cent solution of cocaine and the tube is inserted. The endotracheal tube is firmly anchored in position by means of adhesive tape, and the V connection from the ether vaporizer is attached to the hilt of the tube.

The administration of moderate doses of tribromethanol in amylene hydrate (70 to 80 mg. per kilogram of body weight) rectally prior to the induction of anesthesia makes for a smoother induction and probably diminishes the total amount of ether necessary to maintain anesthesia. Because of the danger of circulatory collapse it is advisable not to use tribromethanol in amylene hydrate if the operation is to be carried out with the patient in a sitting position.

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ABSTRACT OF DISCUSSION

DR. FREDERICK W. CLEMENT, Toledo, Ohio: My associates and I choose one of three agents: avertin with amylene hydrate, pentothal sodium or a gas-oxygen mixture. We use avertin with amylene hydrate occasionally and pentothal sodium for short operations. For many years our anesthetic of choice has been nitrous oxide. Dr. Eversole said: "Since nitrous oxide is such a weak anesthetic agent that it does not permit the administration of sufficient oxygen to allow for the maintenance of anesthesia without some degree of anoxia, this agent is not used unsupplemented." Unfortunately, too little attention is paid to the many advantages of nitrous oxide-oxygen anesthesia. With nitrous oxide or gas-oxygen anesthesia there is usually some anoxemia present, but that does not imply that there will be any severe or troublesome degree of anoxia. The use of the endotracheal catheter operations about the head and neck provides a free and open airway, and 100 per cent oxygen may be administered at any time during the operation for the treatment of respiratory depression. The gases may be delivered under any desired amount of positive pressure and respiration thereby supported. The operative field is left free, and there is absolute freedom from the hazard of explosion. A gas-oxygen mixture may be used for either short or long anesthesia. Within the last year continuous gas-oxygen anesthesia was

5. Connell, Karl: An Apparatus—Anesthetometer—for Measuring and Mixing Anesthetic and Other Vapors and Gases, Surg., Gynec. & Obst. 17: 245-255 (Aug.) 1913. The apparatus is manufactured by the Beard Machine Company, Astoria, N. Y.

6. Manufactured by the Technequipment Company, Station Street, Brookline, Mass.

7. Woodbridge, P. D.: A Flexible Metal Tube for Intratracheal Anesthesia, Anesth. & Analg. 12: 568-570 (Nov.-Dec.) 1934.

induced intratracheally in 2 patients for brain operations. The operation on 1 patient lasted nine and a half hours, and the other operation lasted over eleven hours. At the end of operation, both patients reacted rapidly and were awake within fifteen minutes. What other inhalation agent could be used to duplicate this performance? One factor often overlooked in connection with gas-oxygen mixtures is that as the anesthesia progresses the percentage of oxygen in the mixture must be increased as rapidly as possible without disturbing the level of anesthesia. If this is not done there is grave danger of development of prolonged oxygen want. Our method of using gas-oxygen anesthesia for surgical procedures about the head and neck is to induce anesthesia with a face mask, pass an intratracheal tube by the nasal route, then connect with an adapter to the intratracheal tube or use a nasal inhaler over the tube, the endotracheal tube being used primarily to insure an open airway. Dr. Eversole's paper brings out two valuable points: protection of the patient's eyes during the operation and care to prevent malposition from kinking the endotracheal tube, with consequent obstruction of the airway.

DR. B. BURDELL SANKEY, East Cleveland, Ohio: Adequate support of the circulation for poor risk patients undergoing surgical procedures about the head and neck cannot be overemphasized. Especially in long or shocking procedures it is well to insert a large bore needle in a suitable vein before the operation is started. A continuous, slow, intravenous drip of saline solution may be connected, and if or when the need arises blood plasma or whole blood may be more readily and more quickly administered. A word of caution should here be said about using pentothal sodium or evipal soluble for even short operations about the nose and throat in which even a small amount of bleeding may be encountered. Serious difficulty may be experienced in maintaining an adequate exchange due to collection of blood in the base of the throat. Unless an endotracheal tube is inserted, there are probably other agents which are more suitable for this type of procedure. A relatively simple and satisfactory method of producing adequate anesthesia for certain operations about the head and neck is to employ morphine and scopolamine hydrobromide in divided doses. This method has proved useful for some fractures about the face and jaw for which otherwise an endotracheal setup might be advisable. For certain operations on the eye it is frequently advantageous to combine local with intravenous anesthesia. When employing pentothal sodium for such operations it has been our custom first to spray the nose and throat with a 2 per cent solution of pontocaine hydrochloride. This facilitates the use of a pharyngeal airway, which is inserted after the induction of anesthesia with pentothal sodium. A local anesthetic may then be infiltrated about the orbit, or cocaine may be applied directly to the eye. Oxygen may be administered by a nasal inhaler which is fitted directly on the pharyngeal airway. A 50 per cent mixture of nitrous oxide and oxygen may likewise be administered through the inhaler in conjunction with pentothal sodium.

DR. W. OTIS MCQUISTON, Iowa City: The anesthesia staff at the State University of Iowa's hospitals have recognized the fact that nitrous oxide asphyxia has been used for years for anesthesia. We maintain that with proper individualized premedication surgical anesthesia can be induced and maintained with adequate oxygen. Less than 20 per cent oxygen is never used in our clinic.

DR. URBAN H. EVERSOLE, Boston: I want to thank Drs. Clement, Sankey and McQuiston for their valuable additions to my paper. Dr. Clement has aptly emphasized a most important point in the administration of any anesthetic agent. The safety of any method of administration is measured not entirely in terms of the agent itself but rather in terms of the ability and experience of the man who employs it. I have no doubt that nitrous oxide administered by Dr. Clement is much safer for the patient than it would be when administered by me. Any of the agents discussed may be perfectly safe in the hands of anesthetists who are proficient in their use. I doubt that statistics are available which would properly evaluate the relative hazard presented by varying degrees of oxygen want and the hazard of explosion when inflammable anesthetic agents are used. I am sure, however, that unsupplemented nitrous oxide-

oxygen anesthesia does not allow for the administration of oxygen in as high a concentration as is usually considered normal. The suggestion that the endotracheal tube should be one in which there is no danger of kinking is important. I use the flexible metal tube described by Woodbridge, and with this tube there is no danger of kinking or collapsing. Dr. Sankey's discussion of some of the problems associated with anesthesia for operations on the eye was most interesting. The limitation of time permitted only a sketchy mentioning of some of the many problems involved in the administration of anesthesia for surgical procedures about the head.

USE OF SILVER PICRATE IN THE TREATMENT OF VAGINITIS: A FIVE YEAR STUDY

FORMATION OF A VAGINITIS UNIT IN A
GYNECOLOGIC CLINIC

JOHN D. CORBIT Jr., M.D.

ROBERT McELROY, M.D.

AND

J. H. CLARK, M.D.

PHILADELPHIA

The development of a treatment regimen with silver picrate for patients with *Trichomonas vaginalis* vaginitis in the gynecologic clinic of the Philadelphia General Hospital five years ago has brought about several interesting changes in the clinic. Prior to that time routine smears were not made and the patients were handled in a more or less haphazard fashion. With the revival of interest in this parasite, many types of treatment have been developed, but in following the literature one finds few reports from clinics in which any one form of treatment has been kept up for a considerable length of time. In many places the search for the organism is made under unfavorable conditions and the diagnosis is not always confirmed by laboratory methods. It is our purpose in this paper to state just how the situation in relation to *Trichomonas* infection and vaginitis in general has been managed at this hospital.

DIAGNOSIS

If a good microscope is available for use in the clinic, specimens need not be sent to the laboratory, and the diagnosis of *T. vaginalis* vaginitis becomes easy. With the patient in the lithotomy position, the vulva is inspected and an unlubricated speculum inserted. No lubrication is used on the glove or speculum because usually there is enough vaginal secretion to make it unnecessary, and more specifically because most of the common lubricants are dehydrating agents and render the organism immobile. The cervix and vagina are then inspected and a specimen of the discharge is taken on a cotton swab. The swab is immersed in a test tube containing about 3 cc. of physiologic solution of sodium chloride. This dilutes the material for examination without interfering with the motility of the organism. This motility establishes the diagnosis when a drop of the solution is examined first under the low power and then under the high dry lens of a microscope. In this study cultures were made on all specimens and morphologic studies were made on stained smears. These are not necessary when one becomes familiar with the appearance of the organism in the saline drop-

From the Philadelphia General Hospital.

The nursing staff and the social service workers in the gynecologic dispensary of the Philadelphia General Hospital gave valuable assistance during the course of this study.

let. When the history and clinical appearance are suggestive and yet no motile organisms can be demonstrated, it is important to ask the patient whether she has had a douche just before coming in for examination. If so, she is asked to return for reexamination after having gone at least forty-eight hours without one.

The clinical diagnosis of *T. vaginalis* vaginitis is suggested by a history of discharge and itching and by the finding of reddening about the labia and vaginal mucosa with small punctate hemorrhagic spots in the mucosa, especially on and about the cervix. The usual discharge is thin, frothy, yellowish gray and malodorous. This may be regarded as typical, but the organism is found many times when few of these conditions are present.

The diagnosis of vaginal moniliasis also may be made from a wet preparation and confirmed by streaking a slant of Sabouraud's agar for culture. The discharge here is thick, white and caseous and the vaginal infection is often associated with dermatitis and excoriation about the labia. Most of the patients we see are pregnant at the time.

PREPARATION FOR TREATMENT

When the diagnosis has been established, it is necessary in most instances to clean out whatever mucus and debris are present in the vagina. This is done so

TABLE 1.—Incidence of *Trichomonas Vaginalis* and of *Monilia Albicans* Infection (1935-1940)

Trichomonas Vaginalis			
	Total	White	Negro
Number of patients examined.....	4,850	2,967	1,883
Number with positive reaction.....	1,646	748	898
Percentage with positive reaction*...	33.8	25.2	47.7
Monilia Albicans			
Number of patients examined.....	2,154	1,186	968
Number with positive reaction.....	151	76	75
Percentage with positive reaction*...	7.3	6.4	7.8

* Since these figures are obtained from a group of patients in a definite gynecologic group, the percentages would probably be smaller if taken from a more general hospital group.

that when the medication is applied it can act directly on the infected tissue without having to penetrate a mass of debris. One of the most common agents used for this cleansing is tincture of green soap. However, this has not proved satisfactory in our hands. The soap is mildly irritating to inflamed mucosa, and this, combined with the necessary mechanical scrubbing, has not only failed to remove the mucus efficiently but has caused bleeding in some cases. The cleansing technic recently reported by Savitz and his associates¹ has been used in this study. A cotton sponge, saturated with the kaolin-alumina mixture (aluminum hydroxide-colloidal kaolin suspension to which have been added minute quantities of thymol, eucalyptol and menthol) is used to swab over the vaginal mucosa and cervix. This is washed out with another sponge saturated with sterile water, followed with a dry sponge. In this way, mucus and debris can be efficiently removed without danger of irritation or bleeding, either to eroded or to normal tissues.

This thorough cleansing is important because recurrence of infection can occur from organisms harbored in this debris. In this connection, it is especially impor-

tant to clean out the plug of mucus from the cervix. Cleansing also reveals the extent of the lesions and the true appearance of any pathologic condition that is present. In moniliasis, this technic is helpful in removing the white caseous patches without trauma to the inflamed tissues underneath. When erosions and other

TABLE 2.—Results of Treatment in 1,646 Cases of *Trichomoniasis*

Number of Cases	Percent- age of Cures	Percent- age of Failures	Number of Treat- ments	Length of Time on Treatment
1,419	66.2	...	2-3	2 to 3 weeks
49	3.2	...	3+	3 weeks +
83	4.7	...	1	Lapsed treatment
95	...	5.9	...	Did not respond to treatment

lesions of the cervix are encountered, the usual methods are employed to clear these up before continuing with treatment for the vaginitis. Reinfection may occur from organisms which may persist if these lesions are untreated.

TREATMENT

We have continued with the plan of treatment outlined by Buxton and Shelanski in 1935.² The reasoning that led to the adoption of this technic was as follows: The successful use of silver nitrate in *T. vaginalis* vaginitis had been reported, but although it possesses strong germicidal qualities its corrosive action makes it undesirable for repeated application. Picric acid has been used³ and has a mildly germicidal and soothing effect. It also fixes tissues and tends to render them bacteriostatic, but its germicidal action is comparatively weak. Silver picrate combines the germicidal and soothing action of these two without the corrosive action of the nitric acid salt. It has strong fungicidal and protozoacidal properties with a specific action against *T. vaginalis* in vitro in a 1:1,000 dilution in approximately three minutes.⁴

We use the combined powder insufflation and suppository technic recommended by Golub and Shelanski,⁵ which is briefly as follows: Five Gm. of 1 per cent silver picrate in kaolin^{5a} is insufflated into the vagina at the first clinic visit. This is done with the Shelanski insufflator. The patient is given six silver picrate suppositories^{5a} (2 grains [0.13 Gm.] of silver picrate in a boroglyceride-gelatin base) and instructed to

TABLE 3.—Results of Treatment in 151 Cases of *Moniliasis*

Number of Cases	Percent- age of Cures	Percent- age of Failures	Number of Treat- ments	Length of Time on Treatment
137	91	..	2-3	2 to 3 weeks
16	4	..	3+	3 weeks +
3	2	..	1	Lapsed
5	..	3	...	Did not respond to treatment

insert one each night before retiring and to use a sanitary pad. She is advised to refrain from douches, tub baths and intercourse while under treatment. This

2. Buxton, Russell von L., and Shelanski, H. A.: *Trichomonas Vaginalis* Vaginitis: Incidence, Diagnosis and Treatment with Silver Picrate, *Am. J. Obst. & Gynec.* **33**: 842-845 (May) 1937.

3. Goodall, J. R.: Specific Treatment for Trichomonad Vaginitis, *Lancet* **2**: 648-649 (Sept. 16) 1933.

4. Shelanski, H. A.: Studies on *Trichomonas Vaginalis* in Vitro, *J. Lab. & Clin. Med.* **21**: 790-793 (May) 1936.

5. Golub, L. J., and Shelanski, H. A.: Silver Picrate Treatment of Vaginal Trichomoniasis, *J. Lab. & Clin. Med.* **22**: 1155-1160 (Aug.) 1937.

5a. Supplied by John Wyeth & Brother, Inc., Philadelphia.

1. Savitz, S. P.; Golub, L. J., and Shelanski, H. A.: Vaginal Use of Aluminum Hydroxide and Colloidal Kaolin, *Am. J. Obst. & Gynec.* **39**: 329-331 (Feb.) 1940.

is repeated weekly until the symptoms are relieved and smears are negative for the organism. Two insufflations suffice in most cases, but in some cases it is necessary to give additional insufflations. If tests on a patient remain negative for three consecutive menstrual periods after cessation of treatment, she is considered cured and discharged as such.⁶

VAGINITIS UNIT

The vaginitis unit of a gynecologic clinic need not be separated from the rest of the clinic, but when space is available it is helpful to do so. In our survey, we used a separate room with two examining tables and a bench for the microscope and other laboratory equipment. Under these conditions a physician, with the help of only one nurse, may see a great many patients in a relatively short time. Smears and cultures are taken on all new patients admitted to the general clinic if there are any symptoms or signs of vaginitis. If no other pathologic condition requiring more urgent treatment is found, they return on their next visit to the vaginitis unit. They are followed here until cured or referred back to the general clinic.

It has been interesting to note that some patients who come to the clinic primarily for relief of pelvic pain are cured after treatment in the vaginitis unit. Patients having moderate retroversion or vaguely tender adnexal masses, who complain of pain in the lower part of the abdomen and back ache and who also have vaginitis it has been our custom to refer first to the vaginitis unit and to plan further therapy after the vaginitis and cervicitis have been cleared up. More than a third of these patients are relieved of all complaints when they return. In this way we believe that a certain number of unnecessary pelvic operations have been prevented.

RESULTS

Since the vaginitis unit has been set up we have been able to reduce the time required for each clinic visit. The entire procedure, consisting of diagnosis, preparation, insufflation and instruction, takes but five minutes for each patient. Also, we have been able to bring about more than a 50 per cent reduction in the number of necessary clinic visits.

The incidence found in a series of routine examinations is given in table 1. The cases of trichomoniasis were found chiefly in the gynecologic clinic; several cases, however, were referred from the antepartum clinic. Most of the cases of moniliasis, however, were referred from the antepartum clinic, and only a few were found on routine gynecologic examinations.

Diagnosis in this entire survey was done by smear and culture. In clinical work, however, it is necessary to make the diagnosis only by smear.

From table 2 it may be seen that of 1,646 patients treated for trichomoniasis 86.2 per cent were cured within two to three weeks, 3.2 per cent in more than three weeks, 4.7 per cent lapsed treatment and 5.9 per cent did not respond permanently to treatment, and the focus of infection could not be determined, even though the possibility of Bartholinitis or Skeneitis due to *T. vaginalis* was ruled out. Some of these patients had several recurrences before being finally rid of the infection.

Table 3 shows that among 151 patients with vaginal moniliasis 91 per cent were cured within three weeks, 4 per cent required treatment more than three weeks,

2 per cent lapsed treatment and 3 per cent did not respond to treatment. Some of these patients were too near the time of delivery to continue treatment.

Some patients with a decidedly alkaline urine tend to be irritated by silver picrate therapy. To date we have observed but 2 patients who might be classed as being sensitive to the drug. It is believed that these patients had picric acid sensitivity. There have been no untoward reactions in all the other patients treated with silver picrate.

CONCLUSIONS

A method of management of cases of vaginitis has given satisfactory results in 94.1 per cent of 1,646 cases of trichomoniasis and in 97 per cent of 151 cases of moniliasis.

The establishment of a vaginitis unit and a routine for the management of these cases has resulted in an economy of time for the clinic personnel and a higher percentage of satisfactory results for the patients.

Unnecessary pelvic surgery has been prevented in some cases.

3815 Chestnut Street.

RECENT INVESTIGATIONS ON GONOCOCCIC VAGINITIS

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The New York City Department of Health, with the cooperation of the United States Public Health Service, in 1938 began research on gonococcic vaginitis with the object of studying diagnosis, criteria of cure and epidemiology and of evaluating different methods of treatment. This report summarizes the more important conclusions reached and expresses our agreed opinion and that of the members of the advisory committee¹ who so ably guided the work.

Since the inception of this study, 381 (22.2 per cent) of 1,715 children examined were found to have gonococcic vaginitis. The infected children were examined once a week until the diagnostic laboratory procedures had given negative results for about eight successive weeks, after which they were examined at monthly intervals. Material for examination was obtained by inserting a glass female catheter containing saline solution into the vagina. Portions of the same specimen of exudate were used for smear and for culture.

DIAGNOSIS

Nonspecific vaginitis and gonococcic vaginitis can be differentiated only by smear and/or culture. As can be seen from chart 1, cultures are far superior to smears, especially in the chronic stage of the infection.

This study was supported in part by the Milbank Memorial Fund, the New York Foundation and the Health Research Fund, Inc.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

From the Department of Health, City of New York (Drs. Cohn and Steer) and the Department of Pediatrics, New York University and the Children's Medical Service of Bellevue Hospital (Dr. Adler).

1. The advisory committee for the study consisted of Drs. John L. Rice, Commissioner of Health; Edward L. Keyes, Chairman; Eleanor L. Rice, Reuel A. Benson; Casper G. Burn; Walter Clarke; Alfred Cohn; Adolph Jacoby; Robert M. Lewis; John F. Mahoney; Ralph S. Muckenfuss; Bernard Pacella; Percy S. Pelouze, and Theodore Rosenthal.

6. Hesseltine, H. C.: Fallacies of *Trichomonas Vaginalis* Vaginitis: Streptococci as Etiologic Agents, *Am. J. Obst. & Gynec.* 26: 46-53 (July) 1933. Karnaky, K. J.: Why Does *Trichomonas Vaginalis* Recur? Report of Thirty-Eight Cases, *Urol. & Cutan. Rev.* 42: 812-813 (Nov.) 1938.

CRITERIA OF CURE

It was arbitrarily agreed that children to be considered cured must be clinically normal and that at least seven consecutive smears and cultures made during a period of at least sixteen weeks must show no gonococci. Prolonged study revealed that this was satisfactory for 92.2 per cent of the 204 patients studied intensively. Results of tests of 16 became positive again more than sixteen weeks after they had first become negative. It was impossible to say whether these patients had a recurrence of the original disease or a new infection.

STUDIES ON THERAPY

Forty-one children were observed who were not given any form of treatment. Some recovered within a short time, 54 per cent by the tenth week and 87 per cent by the twenty-eighth week after the beginning of observation (chart 2). This is definite evidence that spontaneous cure of the disease may occur in the majority of patients. These children have remained normal for an average of forty-five and nine-tenths weeks and have had an average of fourteen and four-tenths negative smears and cultures.

TREATMENT WITH ESTROGENIC SUBSTANCES

Thirty-three children were treated with estrogenic substances (amniotin and diethylstilbestrol). The 12 (36 per cent) who were cured were treated for an average of fifty-four and five-tenths days. Comparison with the control series showed that bacteriologically cure was no more frequent among patients given this form of therapy than among the untreated patients. However, definite clinical improvement followed shortly after the institution of treatment.

TREATMENT WITH SULFANILAMIDE

Fifty-three children were treated with sulfanilamide. The 23 (43 per cent) who were cured were treated for an average of nine and six-tenths days. This drug gave definitely better results than would be expected without treatment (chart 3).

TREATMENT WITH SULFAPYRIDINE AND SULFATHIAZOLE

Because the results of therapy were approximately the same, the 20 children treated with sulfathiazole and the 57 treated with sulfapyridine were combined into a single group. The 67 (87 per cent) who were cured received treatment for an average of six and seven-tenths days. These drugs were effective for rectal infection when it was present. Sulfathiazole appeared to be the drug of choice, because it produced fewer toxic reactions (nausea and vomiting) than did sulfapyridine.

For the present it is suggested that children be given ½ grain (0.03 Gm.) per pound (0.5 Kg.) of body weight per day, with a maximum of 30 grains (1.9 Gm.) per day for seven to ten days.

It must be pointed out that, of the 10 children who were not cured by treatment with sulfapyridine or sulfathiazole, only 2 showed gonococcic vaginitis, either clinically or by smear or culture, during the first four weeks after therapy was stopped. An average of eight and two-tenths weeks elapsed before the failure of treatment was recognized in these 10.

EPIDEMIOLOGY

Vaginitis is generally believed to be extremely contagious, requiring only superficial contact for its transmission. Outbreaks in epidemic form have been

described. Infected children are therefore excluded from institutions such as schools, general hospitals, institutions for the care of children and convalescent homes.

However, the question of widespread dissemination of this disease in public places requires reconsideration. In more than five years of search no evidence was found of an epidemic in a New York school although many children with fresh infections attended these schools before a diagnosis was made. During the course of this study no instance of an epidemic in any institution or orphanage was discovered. Isolated cases did occur, but always the suspicion arose that some break in technic had spread the disease or that children had been admitted with unrecognized infection. In one overcrowded dormitory where the possibilities of isolation were remote, only 2 of 90 feeble-minded girls were found to have the disease.

As a result of the foregoing observations, it seems likely that many of the epidemics of vaginitis reported in the past were not due to the gonococcus. There is further evidence that this infection is not as contagious

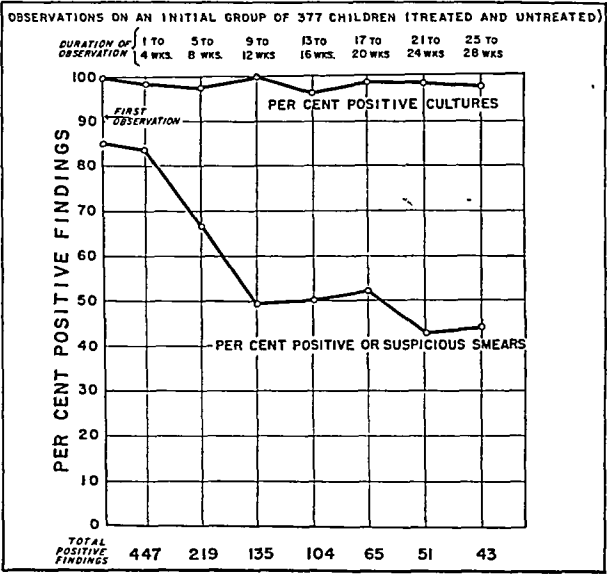


Chart 1.—Accuracy of diagnosis by smear and culture in proved cases (proved by culture) of gonococcic vaginitis.

as has been heretofore believed. In the vaginitis ward of a hospital there were children with acute gonococcic vaginitis, children who were cured and being observed for proof of cure and others who had been admitted to the ward for observation but were later shown not to be infected. No restrictions were placed on these children, and they were not isolated one from another. Over a period of years no instance of disease in the noninfected children was observed. Furthermore, during two different periods of several months all the children in the ward used the same toilets without causing new infections. As many as 8 infected children with profuse vaginal discharge were placed on the same toilet in rotation, and several cultures were made of material taken from the toilet seat. On only one of eighteen occasions were gonococci recovered, and then only a few colonies could be found in one culture. As far as we know, no instance of transmission of the disease by way of the toilet seat has ever been proved.

Investigation of parents and siblings revealed that the probable source of infection in the majority of cases was

an infected adult in the home. Fifty per cent of a group of parents who prior to examination believed themselves healthy were found to be infected. Another important method of transmission that was disclosed is associated with sexual curiosity and experimentation. Thirty-five per cent of infected girls between the age of 6 years and puberty admitted sexual contacts.

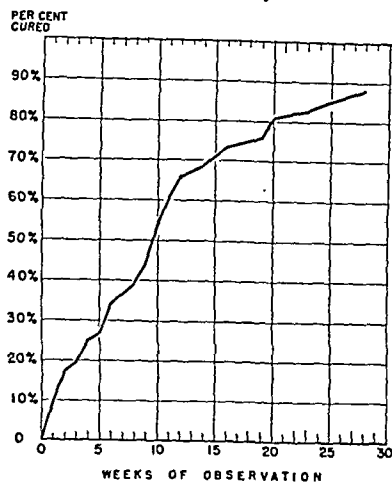


Chart 2.—Gonococcic vaginitis, untreated (control) group: spontaneous cures occurring without treatment in 41 cases during twenty-eight weeks' observation.

It may be concluded that the transmission of the disease requires intimate contact between infected adult or child and non-infected child. Contaminated fomites, such as rectal thermometers, enema tips, diapers, towels and linen may possibly be factors in the spread of the disease.

RECOMMENDATIONS

It is recommended that children not be excluded from

school because of gonococcic vaginitis except during the stage of profuse discharge. The recommendation is based on the fact that the only intimate contact among children would be by way of the toilet seat, which has not been shown to be a factor in the transmission of the disease. It should be understood that sex play should be prevented by adequate supervision. Furthermore, treatment with sulfathiazole would cure most infected children within a few days, so that even with the restriction based on the presence of discharge the children could return to school quickly.

With this form of treatment, vaginitis as a rule is not a disease requiring hospitalization. Even children in

such children noninfectious. It must be remembered that during the first few days aseptic technic should be practiced by the nursing staff. In the care of infected children, instruments and fingers come into intimate contact with the genitals of the patients and if not thoroughly cleansed may possibly infect another child. When a trained, efficient nursing staff is not available isolation of the children in separate wards is to be preferred.

It is further recommended that cultures be used for diagnosis and as criteria of cure and that the follow-up study for the determination of cure last at least sixteen weeks. It is important that family contacts should be examined to discover the source of infection and to prevent reinfection. One should also bear in mind that older children may have been infected during sex play or as a result of sexual intercourse.

125 Worth Street.

ABSTRACT OF DISCUSSION

DR. REUEL A. BENSON, New York: From the pediatric point of view the results of this research are as revolutionary as they are brilliant. Dr. Rice and his co-workers have made a valuable contribution. For many years gonococcic infection in little girls has been a rather disreputable waif, going from the pediatrician, the gynecologist, to the urologist, asking for help and never getting it. Public health officials generally have shunned it. Some years ago the superintendent of schools in New York City filed charges saying that forty-eight children in the public schools had been inoculated with "a loathsome disease" in the public hospitals. The health commissioner investigated that report and exonerated the hospitals, but he did say that the problem of the spread of the disease had never been solved anywhere. Now it has been solved. This paper represents the ideal in practical research. It will serve as a guide for health officers as well as for hospital officials. The dictum that vaginitis "spreads like wildfire" is no longer true, and this, we thought, was about the only "fact" we had in connection with the disease. Hospitalization, local treatment and exclusion from school for long periods now all go by the board. Incidentally, this investigation makes possible great financial saving. At the Metropolitan Hospital in New York we have in the past hospitalized as many as 50 or 100 children with gonorrheal vaginitis, sometimes for months, giving them local treatment which was always bad psychologically, costing the city of New York thousands of dollars annually, and most of these children did not have gonococcic vaginitis at all, although we didn't know that. As a result of the information derived from this investigation we have an average of only 10 or 15 cases, and these are of homeless children coming from child caring institutions. There is also evidence in this report to indicate that a similar study of adult females might lead to equally brilliant results. Undoubtedly the female with gonorrhea is the one who spreads the disease. If such a group could be studied as intensively with cultures, smears and attention to what I would call the "gonorrheal nest," the individual who spreads the disease to the children, we might ultimately have great results in prevention.

DR. GOODRICH C. SCHAUFFLER, Portland, Ore.: I regard the work of Dr. Cohn and his associates, supplemented by that of Dr. Robert Lewis, as a classic commitment. It is sound and permanent, if somewhat revolutionary doctrine. Having so stated, perhaps I may offer some friendly criticisms: Dr. Cohn has proved that gonorrheal vaginitis apparently cures itself almost as well as it can be cured by any medication; and then he assures us that one practically cannot transmit the disease by ordinary contacts. We put ourselves in a dangerous position if we accept his commitments as given here, and if we go ahead and translate them literally into our practice. I don't believe that Dr. Cohn really means that we may actually dispense with treatment or precautions in relation to the transmission of infec-

PER CENT CURED AS COMPARED WITH SPONTANEOUS CURES IN CONTROL GROUP DURING THE SAME PERIOD.	DURATION OF TREATMENT
SULFATHIAZOLE OR SULFAPYRIDINE 43 CASES — 87% CURED UNTREATED ⁽¹⁾ (CONTROLS) — 10% CURED	6.7 DAYS
SULFANILAMIDE 63 CASES — 43% CURED UNTREATED ⁽¹⁾ (CONTROLS) — 12% CURED	9.6 DAYS
ESTROGENIC SUBSTANCE 43 CASES — 36% CURED UNTREATED ⁽¹⁾ (CONTROLS) — 4% CURED	54.6 DAYS

Chart 3.—Course of gonococcic vaginitis in treated and untreated groups. Control group (1): 41 untreated children, with cures occurring during twenty-eight weeks' observation.

institutions for the care of children need not be sent to a hospital, since treatment by the attending physician or a neighboring clinic would be sufficient. Children who must be hospitalized because of complications or the occurrence of concurrent diseases need not be placed in separate isolation wards but may be treated for the complicating factor without regard to the vaginitis. Treatment with sulfathiazole would soon make

tion. For example, his group of so-called untreated patients were handled quite differently from an "untreated group" in the usual sense. These patients were hospitalized under hygienic surroundings and were examined, cleansed and cultured frequently. I have always stressed the value of simple vaginal invasion with distention of crypts in the interest of drainage, incidental to the use of estrogenic suppositories and medicated ointment. There is a mechanical factor of importance here; therefore these children in ideal surroundings, treated weekly or semiweekly by vaginal manipulation, are not typical of a group left entirely alone, and we must not allow any one to suppose that we must not use the strictest precautions in relation to cross infection. In relation to infection from toilet seats, I have this to say: Six children with gonococcal infections, doubtless ordinarily cleansed, were passed on and off a toilet seat; then cultures of the toilet seat were carefully taken, and in only one instance were isolated colonies of *Neisseria* found. Uninfected children were not infected by the use of these seats. I think it has been proved that the culture material available to date is unsatisfactory. It seems likely, then, that culture may be at fault here. Also whereas six children might be exposed safely to such tests, the seventh or the seventieth might be the unfortunate victim. In any event, I don't believe we can dispense with all these precautions. I don't agree that institutionalization is not dangerous from several angles. I am certain that there is a danger in foundling home care. As for hospitalization in general, I admit that, save in exceptional circumstances, it is unsatisfactory from both a practical and a psychological point of view.

DR. HAVEN EMERSON, New York: Twenty-six years ago Dr. William H. Park made a study of the bacteriology of toilet seats in schools in which children with gonococcal vaginitis had been found, and he never found any such organism on the toilet seats. That was done in numerous schools in Brooklyn and Manhattan with the thoroughness and controls characteristic of the work of Dr. Park. We must recognize that one of the most valuable results of specific chemotherapy is the abbreviation of the period of communicability. If a child's period of communicability can be reduced from twenty-six or twenty-eight weeks to one week, a great gain has been accomplished in control of the disease. The risk of careless handling in an institution for children or orphan home is of a different order from what is found in a hospital. The hospital is operated on the basis of a medical aseptic technic. I should be inclined to suggest that we do not change the sanitary code of the city of New York with regard to the exclusion of children with purulent vaginal discharges from any nurseries, not because we believe the association of those children in a hospital would lead to infection but because of obvious risks of infection where less exact and careful measures for bacterial cleanliness are observed.

DR. CARL A. WILZBACH, Cincinnati: I had the privilege more than fifteen years ago of starting a children's vaginitis clinic in the Cincinnati Health Department. In this clinic we soon discovered that the follow-up examination from these children was a splendid method of finding new infectious cases. We made an effort every time we had one of these children to get the parents into the clinic for examination, and we found, just as Dr. Cohn has said, that the source of the infection was usually the adult, the mother or the father, or an older person in the family; so, in addition to the other fine things that have been contributed by this paper, let us remember the case finding possibilities.

The Sulfonamides Not Yet Fully Appreciated.—Living within the epoch, we have hardly yet appreciated the benefits which the new therapy has conferred and will continue to confer upon medicine and mankind. Vaccination, antityphoid inoculation and salvarsan may one day seem small discoveries beside that of sulfanilamide, which was first shown to have therapeutic possibilities in the case of streptococcal infections only six years ago.—Ryle, John A.: *The New Chemotherapy*, *Guy's Hosp. Gaz.* 55:222 (Sept. 6) 1941.

SULFATHIAZOLE IN THE TREATMENT OF GONORRHEA IN WOMEN

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ORA JAMES GIBSON, M.D.

AND

S. EDWARD SULKIN, Ph.D.

ST. LOUIS

The encouraging results obtained by many investigators¹ treating gonorrhea in the male with drugs of the sulfonamide series and the relatively few reports² concerning the use of these drugs in the treatment of gonococcal infection in women suggested the need for further investigation of this problem. Soon after sulfathiazole, the thiazole derivative of sulfanilamide, became available to the medical profession for clinical trial a study was undertaken to determine the efficacy of this drug in a carefully controlled group of hospitalized women. Studies on toxicity in animals by Van Dyke, Greep, Rake and McKee³ and Long, Haviland and their associates⁴ indicated that the drug could be safely used clinically under carefully controlled conditions. It was found that the sulfathiazole compound was approximately one third less toxic than sulfapyridine, based on 50 per cent end point titrations in mice. Metabolic studies have shown that sulfathiazole is more rapidly metabolized and undergoes less conjugation than sulfapyridine. In view of the comparative toxicity and metabolism of these two compounds McKee and her associates⁵ concluded that sulfathiazole is a more desirable therapeutic agent than sulfapyridine.

PLAN OF STUDY

This investigation was conducted over a period of eleven months during which time 194 gonococcal infections in women were studied. The patients investigated were drawn from a special unit of the Venereal Disease

From the Venereal Disease Control Service and Laboratory Section of the St. Louis Health Division.

Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

This study is incidental to the Venereal Disease Control Program sponsored by the St. Louis Health Division in cooperation with the United States Public Health Service.

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2. Moffett, M.: Chemotherapy of Gonorrhea in Women, *Brit. M. J.* 2:111 (Jan. 15) 1941. W. M.; Salberg, J. B., and Koch, R. A.: Comparison of Results With and Without Sulfanilamide, *Am. J. Med.* 223:277 (Aug. 22) 1940. Nime; Van Slyke, C. J.: Sulfanilamide Therapy of Gonorrhea in Hospitalized Prostitutes, in *The Gonococcus*, Publication 11, American Association for the Advancement of Science, New York, Science Press, 1939, p. 132.

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4. Long, P. H.; Haviland, J. W., and Edwards, L. B.: Acute Toxicity, Absorption and Excretion of Sulfathiazole and Certain of Its Derivatives, *Proc. Soc. Exper. Biol. & Med.* 43:328 (Feb.) 1940. Long, P. H.; Haviland, J. W.; Edwards, L. B., and Bliss, Eleanor A.: Toxic Manifestations of Sulfanilamide and Its Derivatives, with Reference to Their Importance in Course of Therapy, *J. A. M. A.* 115:364 (Aug. 3) 1940.

5. McKee, Clara M.; Rake, Geoffrey; Greep, R. O., and Van Dyke, H. B.: Therapeutic Effect of Sulfathiazole and Sulfapyridine, *Proc. Soc. Exper. Biol. & Med.* 42:417 (Nov.) 1939.

Control Service of the St. Louis Health Division, concerned only with the diagnosis of venereal diseases in prostitutes and inmates of bawdy houses. A special city ordinance⁶ providing for the hospitalization and treatment of prostitutes infected with any of the venereal diseases made this study possible.

Every woman showing clinical evidence of gonococcal infection confirmed by laboratory tests was isolated for a period of at least two weeks. Specimens for smears and cultures were obtained on the first and second day of isolation, after which treatment was continued for from four to twelve days. Laboratory examinations were discontinued from the second to the eighth day and were resumed nine days after medication was started, at which time daily specimens for smears and cultures were taken until the fourteenth day. If the last three consecutive smears and cultures were negative, the patient was discharged from the hospital and placed on "quarantine parole." Accordingly, the patient was required to report to the clinic at weekly intervals for pelvic examination and laboratory study. If clinical and laboratory examinations

hours before being transferred to an appropriate culture medium. Immediate refrigeration is essential to inhibit the growth of contaminants which would render subsequent isolation of the gonococcus more difficult. The culture technic used has been described in detail by Sulkin and Gottlieb.⁷ The exudate suspensions were plated on proteose-peptone no. 3-hemoglobin agar and incubated at 36 C. in an atmosphere containing 10 per cent carbon dioxide for forty-eight hours. The oxydase test described by Gordon and McLeod⁸ was used for identifying the gonococcus colonies. Smears were made from the oxydase-positive colonies and stained by an approved Gram technic. In a few instances more complete identification included the carbohydrate fermentation test and the Thomson⁹ alkali solubility test.

A minimum of lubricant, consisting of a dilute solution of tincture of green soap, was used on the speculum in obtaining specimens in this series. Gillick, Sulkin and Stephens¹⁰ feel that the use of K-L jelly or similar lubricants may be responsible for the unsatisfactory results frequently obtained when the cultural method is employed in the diagnosis of gonococcal infections.

TABLE 1.—Results of Sulfathiazole-Beta-Lactose Therapy in One Hundred Cases of Gonococcal Infection

	Number of Weeks After Admission to Hospital																											
	1		3		6		9		12		15		18		21		24		27		30		33		36			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Positive smear or culture..	100		4		0		0		0		3		0		0		0		0		0		0		0		0	
		100		44		0		0		0		66		0		0		0		0		0		0		0		
Negative smear or culture..	0		95		75		54		45		36		20		11		10		9		4		11		0			
		0		95.9		100		100		100		92.3		100		100		100		100		100		100		100		
Lapse in attendance or closed	0		1		25		46		53		55		58		58		59		59		59		59		59		59	
without proof of cure		0		1		25		46		53		55		58		58		59		59		59		59		59		
Cure..	0		0		0		0		0		39		39		41		41		41		41		41		41		41	
		0		0		0		0		0		86.6		92.8		97.6		100		100		100		100		100		

continued negative for twelve consecutive weeks, the patient was considered "clinically cured." Many returned to the clinic for longer periods, thus permitting follow-up study for six months or more. If a positive smear or culture was obtained at any time during this "parole period," the patient was again hospitalized and subjected to another complete study. The condition was considered a recurrence of the original infection, regardless of the length of time since termination of the first course of treatment, unless reinfection could definitely be established.

DIAGNOSIS

To collect specimens for the smear and cultural methods of examination the urethral meatus was cleansed with sterile cotton, then pressure was applied to the urethra and Skene's ducts to obtain adequate material for examination. The exudate was collected on sterile cotton swabs. Cervical specimens were obtained by compressing the portio between the blades of a Graves speculum to force the contents of the deep racemose glands into the cervical canal. This exudate was also collected on a sterile swab. The urethral and cervical specimens were placed in the same tube containing 1 cc. of broth (proteose-peptone no. 3) to prevent the exudate from drying. The suspensions were kept in a refrigerator for not longer than six

OUTLINE OF TREATMENT

Two methods of treatment were used. The first 100 patients received sulfathiazole¹¹ and vaginal instillations of beta-lactose boric acid. The second group of 94 patients received only sulfathiazole. The administration of sulfathiazole was the same in the two groups. A clinical criterion by which to govern the daily dose of sulfathiazole had not been established at the time this study was begun, hence an arbitrary dose was decided on. Sixty grains (4 Gm.) was given in divided doses of 15 grains (1 Gm.) each four times a day for five consecutive days. This daily dose was approximately equivalent to 1/2 grain (0.03 Gm.) a pound. Medication was begun as soon as the diagnosis of gonorrhea was established, without regard for the phase of the menstrual cycle. A second course of treatment was given as a routine during the following period of menstruation. If menstruation occurred during the first administration of the drug, medication was not repeated during the subsequent period. When it

7. Sulkin, S. E., and Gottlieb, Eleonore: The Use of an Improved Culture Medium in the Diagnosis of Gonococcal Infection in the Adult Female, *Am. J. Syph., Gonorr. & Ven. Dis.* 25:22 (Jan.) 1941.

8. Gordon, J., and McLeod, J. W.: The Practical Application of the Direct Oxidase Reaction in Bacteriology, *J. Path. & Bact.* 31:185 (April) 1928.

9. Thomson, D. *Gonorrhea*, London, Oxford University Press, 1923, cited by Pelouze, P. S.: *Gonorrhea in Males and Females*, Philadelphia, W. B. Saunders Company, 1939.

10. Gillick, F. G.; Sulkin, S. E., and Stephens, L. J.: Common Error in Obtaining Specimens for the Cultural Diagnosis of Gonococcal Infection in the Female, *Ven. Dis. Inform.* 21:288 (Sept.) 1940.

11. An unlimited supply of this drug was made available by the Winthrop Chemical Company, Inc.

6. Bredeck, J. F.: What Every Physician Should Know About the St. Louis Venereal Disease Ordinance, *Bull. St. Louis M. Soc.* 24:148, 1939.

did not occur before the patient was discharged from the hospital she was given enough sulfathiazole for another course of therapy to be taken during her next menstrual period. This precaution was taken because preliminary observations suggested that menstruation may be responsible for an exacerbation of the infection.

Every patient showed some degree of cervical infection. Since many infections were associated with extensive erosions, an endeavor was made to restore and maintain a normal vaginal acidity (p_H 4.0 to p_H 4.2). The vaginal suppositories of beta-lactose boric acid described by Roblee¹² containing 80 per cent beta-lactose and 20 per cent boric acid powder in no. 11 veterinary capsules were used. One capsule was inserted into the vagina each evening at bedtime for twelve consecutive applications. Douches were not

referred back to us because smears and cultures were still positive. A second course of sulfathiazole was started but had to be discontinued after the first day because the reaction mentioned was well developed on the morning of the second day. Laboratory examinations on the second patient were negative after one course of sulfathiazole alone. Menstruation ensued fifteen days later so that a second course of treatment was started but had to be stopped after the first day because severe and uncontrollable nausea and vomiting developed. It stopped spontaneously twenty-four hours later. The patient was discharged sixteen weeks later classified as a clinical cure.

Seven patients showed mild nausea and malaise which were relieved by the administration of 7.5 grains (0.5 Gm.) of sodium bicarbonate with each dose of

TABLE 2.—Results of Sulfathiazole Therapy in Ninety-Four Cases of Gonococcal Infection

	Number of Weeks After Admission to Hospital																							
	1		3		6		9		12		15		18		21		24		27		30		33	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Positive smear or culture..	94	100	2	2.1	1	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Negative smear or culture.	0	0	92	97.8	74	98.7	61	100	41	100	26	100	16	100	9	100	4	100	2	100	1	100	0	100
Lapse in attendance or closed without proof of cure	0	0	0	1	19	20.2	43	45.7	53	56.3	54	57.4	54	57.4	54	57.4	54	57.4	54	57.4	54	57.4	54	57.4
Cure...	0	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	0	0	0	0	0	0	0	0	0	97.5	100	100	100	100	100	100	100	100	100	100	100	100	100	100

TABLE 3.—Composite Results of Sulfathiazole Therapy in One Hundred and Ninety-Four Cases of Gonococcal Infection

	Number of Weeks After Admission to Hospital																							
	1		3		6		9		12		15		18		21		24		27		30		33	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Positive smear or culture	194	100	6	3.1	1	0.51	0	0	0	0	3	1.5	0	0	0	0	0	0	0	0	0	0	0	0
Negative smear or culture.	0	0	187	96.4	140	97.5	105	100	88	100	62	98.5	36	100	20	100	14	100	11	100	5	100	1	100
Lapse in attendance or closed without proof of cure	0	0	1	0.51	44	22	89	45.8	106	51.6	109	56	112	57.7	112	57.7	113	58.3	113	58.3	113	58.3	113	58.3
Cure	0	0	0	0	0	0	0	0	0	78	78	80	80	80	80	80	80	80	80	80	80	80	80	80
	0	0	0	0	0	0	0	0	0	91.2	95.1	97.6	100	100	100	100	100	100	100	100	100	100	100	100

permitted during this period. Specimens for smears and cultures were taken during the last three days of local therapy. Beta-lactose was not repeated under any circumstances, nor was it ever given during menstruation.

TOXIC MANIFESTATIONS

Toxic manifestations were noted in 13 (6.7 per cent) patients. In 2 instances the drug was discontinued, in 1 because of a severe cutaneous reaction developing in the form of a painful urticarial rash. The circumstances associated in this instance were unusual. On admission to the hospital it was found that in addition to a gonococcal infection the patient had a pregnancy of approximately eight weeks gestation. No reactions were noted with the first regular five day course of sulfathiazole. Two days after therapy was completed signs of abortion threatened and she was immediately transferred to the City Hospital. Fourteen days after the completion of a spontaneous abortion she was

sulfathiazole, thus permitting them to continue treatment. Three additional patients suffered mild fever reactions and complained of chilly sensations and nausea, but the temperature remained normal. They, too, were able to continue their treatment when given sodium bicarbonate. One patient had a mild urticarial reaction but was able to continue taking the drug.

Similar toxic manifestations resulting from the use of drugs of the sulfonamide series have been reported by Flippin, Schwartz and Rose,¹³ Greenwood,¹⁴ Mahoney, Wolcott and Van Slyke¹⁵ and others.

EPIDEMIOLOGY

Sixty-three per cent of the patients were white and 37 per cent were Negroes; 46 per cent were between the ages of 21 and 25, 20 per cent were between 26

13. Flippin, H. F.; Schwartz, L., and Rose, S. B.: Comparative Effectiveness and Toxicity of Sulfathiazole and Sulfapyridine in Pneumococcal Pneumonia, *Ann. Int. Med.* 13: 2038 (May) 1940.

14. Greenwood, A. M.: Skin Manifestations Due to Sulfanilamide and Its Derivatives, *New England J. Med.* 224: 237 (Feb. 6) 1941.

15. Mahoney, J. F.; Wolcott, R. R., and Van Slyke, C. J.: Sulfamethylthiazole and Sulfathiazole Therapy of Gonococcal Infections, *Am. J. Syph., Gonorr. & Ven. Dis.* 24: 613 (Sept.) 1940.

12. Roblee, M. A.: Vaginitis and Cervicitis, *J. Missouri M. A.* 34: 285 (Aug.) 1937.

and 30, 14 per cent were between 31 and 35 and 18.5 per cent were under 21. The youngest was 18 and the oldest 60.

Syphilis was present in 26 per cent of the 194 patients treated for gonorrhea. Condylomata acuminata were noted in 5 patients and a diagnosis of fibromyomata uteri was made in 5 others. Chancroidal infection substantiated by a positive cutaneous reaction was found in 2 of the younger group and lymphogranuloma venereum was found in another 2. Each gave a strongly positive reaction to the Frei test. There were 1 perianal and 2 paraurethral abscesses. Seven members of the group were drug addicts, each giving a history of scanty or no menstruation since forming the habit. Two patients were in the first trimester of pregnancy.

Every patient was classified as having chronic gonorrhea with the exception of 2 who were given absolute bed rest because their infections were acute. The only death in the series occurred from other causes six weeks after release from the hospital. Five patients having Bartholin abscesses were kept under observation

intervals on the chart devised by Rogers Deakin in his study of the treatment of gonorrhea in the male. Information contained in the accompanying tables is the result of an analysis of these records.

Table 1 refers to the first series of cases in which the sulfathiazole-beta-lactose therapy was used. All smears and cultures taken during the first week were positive, whereas during the third week positive laboratory examinations were obtained in only 4 (4.4 per cent) cases, each of which was considered a recurrence and therefore was subjected to another course of treatment. From the sixth to the fifteenth week all laboratory examinations were negative. During the fifteenth week positive cultures were obtained in 3 cases which had been pronounced clinical cures, since they had fulfilled the aforementioned criteria. However, the possibility of reinfection was established before they were listed as new cases. All smears and cultures in those followed for longer periods of time were negative.

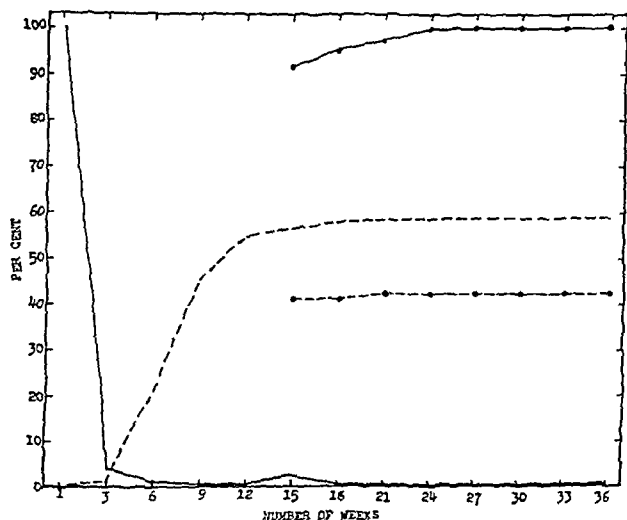
Whenever a patient failed to return to the clinic for weekly follow-up examinations an arrest order was issued and she was brought in by the police, unless she had left the city. This accounted for the fact that it was possible to have 47 per cent of the patients under follow-up observation at the end of the twelfth week and 41 per cent of them at the end of the thirty-sixth week.

Eighty-six and six-tenths per cent of those under observation at the end of the fifteenth week were considered clinical cures, while all patients under observation at the end of the twenty-fourth week were considered clinical cures.

Table 2 shows results of treatment with sulfathiazole alone. All smears and cultures were positive at the end of the first week; positive results were obtained in only 2 (2.1 per cent) cases during the second week; after the third week all laboratory examinations were negative. Forty-seven per cent of this group of cases were under observation at the end of the twelfth week, and weekly smears and cultures were still being taken in 46 per cent of them thirty-six weeks after admission to the hospital. Ninety-seven and five-tenths per cent of these cases were pronounced "clinical cures" at the end of the fifteenth week and were still considered as such after a period of nine months had elapsed.

After a detailed analysis of these two groups it was obvious that local beta-lactose therapy had not been a factor in their treatment. For this reason the 194 cases have been summarized as a composite group (table 3) and may be recapitulated as follows: Smears and cultures were positive in 6 cases during the third week and in only 1 case at the end of the sixth week. The positive results obtained in three cases during the fifteenth week have been previously explained. Forty-five and four-tenths per cent of the cases were still under observation at the end of the twelfth week, while 41.7 per cent of the entire 194 cases were still being observed at the end of the thirty-sixth week.

Ninety-one and two-tenths per cent of the total number of patients under observation at the end of the "quarantine parole" period (twelve weeks) were considered "clinical cures," having completed prescribed treatment and giving negative results. By the end of the twenty-fourth week all patients under observation were "clinically cured." The results are presented graphically in the accompanying chart.



Results of treatment of total number of patients under observation at end of "quarantine parole" period. Solid line indicates positive smear or culture; broken line, lapse in attendance or closed without proof of cure; dots and lines, actual percentage of patients cured; dots and dashes, percentage of total number of patients cured.

for from ten days to three weeks, but in no instance were positive smears or cultures obtained from any part of the genital tract; therefore they are not included in this report. Twenty-one per cent of the patients had been subjected to operations for some type of pelvic inflammation. Thirty-five per cent had had at least one full term pregnancy, 1 patient having been delivered nine times. Twenty-six per cent admitted one or more induced abortions, the greatest number being seven by a 23 year old white girl.

Forty-five per cent of the patients had gonorrheal infection of the cervix alone; 43 per cent had both cervical and urethral infections, while the remaining 12 per cent had infections only in the urethra.

ANALYSIS OF RESULTS

Special forms were prepared for recording all information pertinent to this study. In general, the plan suggested by Deakin and his associates¹⁶ was used. The progress in each case was recorded at weekly

16. Deakin, R.; Wortman, M. S., and Lawrence, J. V.: Medical and Social Research in Gonorrhea, Ven. Dis. Inform. 21:255 (Aug.) 1940.

SUMMARY AND CONCLUSIONS

1. The object of this investigation has been to ascertain the efficacy of sulfathiazole in the treatment of gonococcal infections in women. One hundred and ninety-four hospitalized patients were subjected to a carefully controlled study. Two methods of treatment were employed, one consisting of the oral administration of 60 grains of sulfathiazole daily for five days and a vaginal suppository containing beta-lactose and boric acid. The suppository was given once a day for twelve consecutive days. The second method of treatment consisted of the same dose of sulfathiazole given without the beta-lactose.

2. Every patient showing clinical evidence of a gonococcal infection that could be confirmed by laboratory examination was isolated for a period of at least two weeks in a special unit of the St. Louis City Hospital. Special forms for recording all information pertinent to this study were employed.

3. Toxic manifestations were noted in 13 (6.7 per cent) cases and were sufficiently severe in 2 of them to necessitate termination of treatment. The most pronounced reaction was in the form of a painful urticarial rash in 1 case, while uncontrollable nausea and vomiting developed in a second. All cutaneous manifestations disappeared within seventy-two hours after administration of the drug was discontinued. Nausea and vomiting ceased within twenty-four hours after medication was stopped. In 7 cases there were mild nausea and malaise which were relieved by the administration of $7\frac{1}{2}$ grains of sodium bicarbonate for each dose of sulfathiazole. Mild fever reactions associated with chilly sensations and nausea were observed in 3 cases, all of which were relieved with sodium bicarbonate. In every case in which it was necessary to discontinue treatment reactions developed after the second course of medication was started.

4. One death in the series occurred six weeks after release from the hospital. This patient, a drug addict, had syphilis and acute malaria in addition to a gonococcal infection. Bartholin's abscess did not occur in this series.

5. Every case was classified as chronic gonorrhea with the exception of 2 in which there was an acute inflammation of the cervix, urethra and both adnexae associated with a severe febrile reaction. The cases classified as chronic gonorrhea presented no symptoms. This is in contradistinction to those classifications wherein the mere finding of a positive slide or culture warrants a diagnosis of acute gonorrhea.

6. Forty-five per cent of the patients had a gonorrheal infection of the cervix alone. In 12 per cent only the urethra was involved, while 43 per cent had both cervical and urethral infections. Every patient in whom the pelvic adnexae were present showed some type of chronic inflammatory condition.

7. A detailed analysis of the two groups of patients revealed that beta-lactose therapy had no influence on the treatment of gonococcal infection. Ninety-one and two-tenths per cent of the total number of patients under observation at the end of the "quarantine parole" period (twelve weeks) were considered "clinical cures." It may therefore be assumed that sulfathiazole in the treatment of gonococcal infections in the female is highly effective in a great majority of cases.

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ABSTRACT OF DISCUSSION

DR. WILLIAM H. VOGT, St. Louis: The authors have studied 194 cases of gonorrheal infection of the female and their results are most encouraging. The fact that these patients were hospitalized under a city ordinance and therefore had no opportunity for sexual relations during the course of treatment and also no chance of reinfection undoubtedly played an important part in obtaining the rapid cures. As I understand it, this report deals entirely with gonorrheal infections below the internal os. I wonder whether the authors have had any experience with this drug in the infection higher up in the pelvis. If equally good results can be obtained from this form of treatment in gonorrheal inflammation of the pelvis where it so often becomes necessary to sacrifice tubes and ovaries, the drug is truly to be considered a valuable addition to our armamentarium. The most serious complication in this group seems to have been a severe painful urticaria in 1 case of pregnancy associated with gonorrhea and 1 milder case of urticaria. All the other complications were mild nausea and malaise. Certainly one cannot criticize the drug on that basis. Serious conditions such as sulfhemoglobinemia, agranulocytosis and hemolytic anemia did not occur. No mention, however, was made of the need for the determination of blood concentration levels, and I am wondering whether these investigators did not think that this was necessary. In certain diseases associated with a high mortality and for which there is no reliable therapy, one may be justified in administering this drug in spite of some inherent risk and lack of facilities for determining the blood concentration. In less serious cases, however, such as gonorrheal infection, greater caution should be exercised in its use. I noticed that a discussion of the failure was omitted and I should be glad to have Dr. Fletcher say just what his plan of treatment has been in those obstinate forms of infection.

DR. WILLIAM BICKERS, Richmond, Va.: I am sorry but I must disagree with the speaker. In the last year I have accumulated a report on 50 acute cases of gonorrhea in women. Each alternate 1 was treated with sulfathiazole. At the end of the treatment period (and the treatments were well controlled by smears and the like) I myself evaluated each case, not knowing at the time of examination which patient had received sulfathiazole and which I had not. The conclusion is that we were not able by reviewing the histories of the patients, that is as to time when the smears became negative, the disappearance of dysuria, the absence of complications, the loss of days from work, and all of the other criteria by which we estimate the cure of gonorrhea in women, to make any distinction between the group treated by sulfathiazole and those that were not.

DR. PAUL F. FLETCHER, St. Louis: In answer to Dr. Vogt's question relative to treatment in obstinate cases, we found persistent foci of infection in the urethra and in the cervix in 8 cases. In 2, conization of the cervix was necessary. In 6, destruction of Skene's ducts with an electric cautery was employed. Those were the only obstinate cases in the series. Two cases showed inflammatory reaction. In each of them there was an acute or subacute bilateral salpingitis. The patients were deliberately subjected to the same course of treatment and by the time they left the hospital, within two weeks, all pelvic findings were essentially negative. With regard to Dr. Deakin's question relative to a method of controlling prostitutes after they are released from the hospital, two methods are being tried whereby they might be more effectively controlled, but time will not permit going into that now. In reference to the comments of my second discussor, I should like to say again that every 1 of these patients was a prostitute. All except 2 cases had to be classified as chronic gonorrhea. There is no question that close supervision and hospitalization were important factors. In contrast to this group, we have records of some 300 prostitutes who were treated with sulfanilamide and local therapy. By comparing the two groups of patients, the figures and facts speak for themselves. Our impressions and conclusions are based strictly and carefully on these facts. That is why we think sulfathiazole is effective in the treatment of gonorrhea in women in a rather high percentage of cases.

TRAUMATIC CHANGES IN THE RETINA, CHOROID, NERVE HEAD AND VITREOUS

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Ocular tragedies are increasing in industry, in the home, in the school and in travel; so there is need for a review of the traumatic changes in the fundus and their differentiation from the nontraumatic. The application of facts learned in private practice is of immense practical value in times of stress, for it enables the alert physician to interpret the signs of early damage as well as to appraise correctly the end results.

The dominant signs of ocular injuries are hemorrhage, edema, ischemia and destruction of tissue. Their amount, location and extent provide the unpredictable elements.

A foreign body may strike the eye with varying force and from various angles. There is no accepted, dogmatic rule for determining the resulting changes in the fundus, but Lagrange, in his monumental sketchbook, presented conclusions well substantiated by his drawings and for certain war injuries laid the foundation for future advances.

In this clinical review an attempt is made to present the alterations in the fundus so clearly that the ophthalmoscopic patterns will become living designs.

Whenever a person has an accident to the eyes or the head he should be examined by one competent by training and a continuous experience to render an opinion. It must be understood that many injuries produce immediate, visible changes while with others the alterations are delayed and reexaminations are therefore imperative.

It will be shown that holes in the macula can result from injury, from inflammation of the uveal tract or from disturbance of the retinal circulation. Therefore, when one or more of these agents are present great care must be exercised to evaluate properly the effect of trauma.

TRAUMATIC HOLE

The traumatic hole at the retina is unilateral, except on rare occasions when both eyes are injured. This is a fundamental concept of the traumatic hole. The hole varies greatly in size, from $\frac{1}{6}$ to at least 2 disk diameters. The border may be a uniform gray, speckled with white spots, a few isolated dots, scattered pigmentary collections or thick gray tags. The crater ranges from a shallow excavation to a deep punched-out hole. The floor, or base, of the crater varies from dark red to pale pink and from a uniform granular appearance to one presenting dark ridges of irregular pigmentation, dense almost uniform sheets of pigment or scattered overlying white spots or films, or combinations of these, so that the floor may be smooth or rough. Finally, there are circummacular changes, such as pigmentary deposits and absorptions or massive connective tissue circles. It is therefore apparent that traumatic holes at the macula are not identical; further, it should be remembered that the macula does not always occupy the same position, for it may be either above or below the classic location.

If, then, the traumatic hole is visualized as a more or less sharply outlined red macular area with a distinct rim with tags on or about it, a physical differentiation must be made from a hole caused by circulatory or inflammatory changes, and, although no clearcut distinction is possible, the margin of error can be reduced to a minimum in this way. The appearance of every hole should be subjected to a critical analysis and then the possible causes considered.

The inflammatory hole is always unilateral unless there is bilateral inflammation. The evidence of involvement of the uveal tract: adhesions of the iris, vitreous opacities, complicated cataract and signs of choroidal and retinal disease, is always present. There are no significant differences in character between this hole and the others.

Circulatory holes are usually smaller than the traumatic ones and may be so small as to be overlooked because of the slight difference in color. They are always associated with changes in the retinal vessels ranging from little alterations to severe atheromas. They are bilateral, but one should not be misled if a hole is not present in both eyes the first time one examines a patient, for, although often circulatory holes are bilateral when first discovered, years may intervene before the second eye becomes involved. Delayed involvement of the second eye has been proved photographically in a sufficient number of cases to warrant emphasis, especially as the visual reduction is often little. The development of a circulatory hole from an overlying flat gray haze to cystic degeneration and finally to a clearcut hole has been observed. Often the rim is sloping. The crater may be shallow and scarcely measurable without a slit ophthalmoscope or a binocular one. Red-free light focused to transilluminate the macular area will often disclose the hole before it can be seen by the ordinary diffuse brilliant light. A delicate vitreous cloud may be so placed as to suggest the rim of a hole and may so obscure the border that the hole seems small.

In certain hypertensive patients without or with definite sclerosis a delicate, golden yellow, fine-meshed net forms about the uncovered macula, which stands out clearly as a more or less circular red disk. Neither this nor a dark macula should be mistaken for a hole. Careful ophthalmoscopic analysis will prevent these mistakes. A patient with hyperpiesia may receive a direct blow on the eye, and later a hole may develop in the macula. The relation of the blow to the development of the hole presents a medicolegal problem of considerable importance and calls for a careful consideration of the entire subject.

The hole that is found in detachment of the retina is curiously different. If the retina is in great folds the red hole seems to expand, contract and change its size every time the waving sheet moves. At one instant it is round, at another oval and at another a mere slit. When the retina is thick, gray and far displaced from the choroid the difference in level is striking and the dark crater is vivid against the whitish gray retina.

When the macula is involved after an operation or in a flat detachment it is usual to find many small, slightly elevated, light-reflecting cysts or the retina may be honeycombed throughout the entire region. There is no difficulty in distinguishing this kind of macular hole from the others, and whether it should be considered traumatic must be determined after the cause of the detachment is decided.

Before I leave the discussion of holes, it is necessary to mention the small one found in children with amblyopia and the clearly outlined hole in patients with glaucoma.

The macular hole is common and is seen far more frequently than published reports indicate.

RUPTURE OF CHOROID

Rupture of the choroid may be completely overshadowed by a hemorrhage, an exudate, edema or all three, so that no suggestion of an underlying tear is evident for several days. In the least complicated form there is an isolated yellow-gray swelling without hemorrhage. As the swelling disappears a yellowish band becomes apparent, usually more or less concentric with the disk, often to the temporal side but not rarely to the nasal. Ruptures may be single or multiple, more or less parallel to each other, angular, horizontal or stellate.

The most extensive tears follow severe direct blows which cause choroidal and retinal bleeding and detachment of the retina. The usual outcome is restoration of the retina to its former position, and if the rent does not involve the macular region, serviceable, functional recovery. The tear may leave areas of retinal and choroidal atrophy, or the separated yellow bands may become dense fibrous plaques. The color of the rupture depends on the time which has elapsed between injury and first examination. Early after injury the rupture is yellowish pink, with an indefinable margin, while later it is white, with sharp edges. Some cases have been reported in which pigmentation was said to be present immediately after an injury. Considered from a practical standpoint the reports cannot pass unchallenged, because the immediate presence of pigmentation is inconceivable, and pigmentation is of considerable value in the medicolegal determination of the time factor. Such unconfirmed statements are unjustified.

A rupture may shrink, remain stationary or even enlarge. Every case is instructive and of permanent value to the clinician who records the changes by means of photographs, for the patterns are often complicated in outline and surface, so that verbal descriptions are unsatisfactory. When a rupture of the choroid is combined with pigmentary degeneration, it is fair to assume that both have been caused by an injury.

Traumatic rupture of the choroid must be differentiated from the spontaneous choroidal tears which occupy the macular and paramacular regions in persons with high myopia. The refractive error, the angular rents (often with intact choroidal vessels either on the base or along the side of the deepest portion) and the uninterrupted state of the retinal vessels as they cross over the gaps are pathognomonic and are sufficient to exclude the diagnosis of a traumatic lesion.

Another confusing picture is that caused by tuberculous infiltrations, in which the pigmentation and elevation of portions of the center of each scar, with a superficial film over it, such as I first described in 1929 in a photographic exhibit on choroiditis, make the classification possible.

RUPTURE OF THE RETINA

Rupture of the retina is seldom diagnosed, for two reasons: It is difficult to see, and it is rare. Occasionally one finds a delicate interrupted superficial break in the retina after the traumatic edema has sub-

sided. The break is only slightly less pink than the rest of the fundus, the pigmentation is limited and vision often is unimpaired. Most often the tear is a horizontal line in the macular area which shows little or no tendency to close.

BERLIN'S EDEMA

The severe, acute macular edema first well described by Berlin causes transitory blindness when it is sufficiently great to blanch the retina in a more or less circumscribed macular area. Occasionally the pallor assumes the intensity of an embolic closure; more often there is a faint bloody effusion which gives a reddish or yellowish tinge to the swelling. When this is extreme it causes an elevation of the macula and a central scotoma. Occasionally there are collections of fine granular pigment.

EMBOLISM OF CENTRAL RETINAL ARTERY

Sudden loss of vision from embolism of the central retinal artery, with all its classic signs and symptoms, has been observed to follow immediately a forcible blow on the eye.

CHOROIDAL HEMORRHAGE

A direct compression of the globe may cause choroidal hemorrhage, which is seen as an oval or round bulging of the retina. If it is large the overlying retina is gray or almost milky white. When the borders are sharply outlined the retinal vessels curve over the surface. The hemorrhage may have a frayed edge, or the retina may be detached over the blood. There is no tendency for the blood to break through the retina, and the clinical course of absorption is one of decrease in size and thickness until the hemorrhage disappears. In some cases an outer granular ring shows where the blood has been, while in others the raised surface looks like melting snow. The hemorrhage frequently bulges over the borders of the disk as a smooth, glistening, dark red prominence.

GLAUCOMA

Increased ocular tension following a blow may pass unnoticed unless the elevation is great or rapid or both. In some cases hyphemia develops either immediately after the accident or some days later. If glaucoma is recognized and an operation performed early, the changes in the fundus are few, but if surgical intervention is delayed large deep retinal hemorrhages and choroidal extravasations are found, with a total glaucomatous excavation of the nerve.

TRAUMATIC ATROPHY OF THE OPTIC NERVE

Traumatic atrophy of the optic nerve has been described and recognized for many years. It may be partial or complete, sudden or gradual, and may be a complication of a severe injury of the head, a blow to the face or a seemingly trivial fall to which little attention is paid until the dimness of vision becomes apparent. This atrophy must be distinguished from that caused by the usual nontraumatic agents, which include syphilis, increased cranial pressure, the neuritides in general and embolism of the central retinal artery. The papilla may retain its normal color for a long time after an injury, although cases have been reported in which the nerve head turned white immediately after an accident.

AVULSION OF THE OPTIC NERVE

Avulsion of the optic nerve is most often the result of a gunshot wound when the bullet, as it passes through the skull, cuts one or both optic nerves. When the

nerve is completely severed the region of the papilla is a great white depression. Usually, a thick, white, elevated connective tissue band of variable width and excessive pigmentation surrounds the scar. When the nerve is partially detached from its insertion the amount of scar tissue makes it look like a deep glaucomatous excavation. White proliferating bands and depigmentation of the choroid similar to those of traumatic retinochoroiditis are often prominent.

The end results of total or partial avulsion are so striking that once seen they will always be remembered. Partial avulsion is the more difficult to diagnose.

CONGENITAL COLOBOMA

When congenital coloboma of the disk and the choroid is associated with a marginal zone of depigmentation, care must be taken to avoid calling it a traumatic lesion.

RETINITIS PROLIFERANS

Retinitis proliferans may follow a penetrating wound and show as white strands adherent to the disk and at the points of contact in the retina. The bands may be thick and smooth, with many vessels on them, or delicate and avascular. They may be in any portion of the fundus but seem to have a predilection for the peripapillary region. In some cases the bands of proliferation are dark, almost black, beneath more superficial, lighter webs. They are distinguished from the retinitis proliferans of tuberculosis by their isolation and by the tendency to remain stationary. In tuberculosis recurrences are not infrequent. In the retinitis proliferans of diabetes the sheets are denser and more vascular, for the vessels are in many layers, while in hypertension and syphilis changes in the retinal vessels are always present.

TRAUMATIC MACULAR PIGMENTATION

Pigmentary changes in the macula may be linear or spotlike. The fovea may be brownish yellow, in contrast to the pale red fundus. The changes may follow the extraction of an intraocular foreign body and may be a primary retinal change or a secondary terminal effect. Macular retinal hemorrhage, juvenile macular choroiditis, retinochoroiditis and disciform degeneration may suggest by their location and shape the traumatic changes. Careful inspection will distinguish one from the other.

TRAUMATIC RETINOCHOROIDITIS

Traumatic retinochoroiditis with permanent visual loss may appear under several more or less distinct forms. The areas may be widespread and may cause extensive destruction, for they follow either direct contusion or compression of the globe. Immediately after the accident the retina is white and swollen, with a few hemorrhages on its surface. The pigmentation does not become apparent until the swelling has disappeared. In unusually bad cases there is rupture of the choroid and detachment of the retina. It takes several weeks for a severe lesion to become resolved. Traumatic retinochoroiditis is differentiated from areolar sclerosis by two facts: First, in sclerosis the border is sharp and clearly separates the diseased from the uninvolved portions of the fundus, whereas in traumatic retinochoroiditis the border may be pigmented in only a part of its circumference and usually blends with the surrounding retina. Second, in sclerosis the floor almost always consists of grossly sclerosed choroidal vessels

with or without scattered pigmentation, and sometimes in cases of long standing the vessels are reduced in number, while in traumatic retinochoroiditis the choroidal vessels are not sclerosed and, as a matter of fact, are notably reduced in size and number. In non-traumatic retinochoroiditis of the exudative type thick white scars with dense pigmentations are often encountered.

PENETRATING WOUNDS

Penetrating wounds of the globe may produce localized damage at the site of puncture; these include pigmentation, scars and proliferation. When the eyeball is penetrated from the rear, unusual rounded tubular membranes often project through the distended and stretched coats like fingers through a dark, heavy woolen cloth. Anterior, or lateral, perforations are much more common, and if the wound is back of the lens and is not infected, a scar is found, varying from a single line to a wide band. The latter leads to total detachment of the retina.

CHANGES DUE TO FOREIGN BODIES

Changes caused by intraocular foreign bodies form a class of their own. When a BB shot enters the globe, it may cause considerable destruction of the retina and choroid, or after striking the retina it may settle in one of the lower quadrants. When it does, if the patient is placed on his side the force of gravity will cause the shot to become lodged in the sclera and produce a secondary inflammatory reaction. As soon as this occurs an incision over the most prominent point will enable the surgeon to remove the shot with little added trauma.

If the foreign body is steel or iron, it may be possible to see it in the vitreous, more commonly in the retina or, when it penetrates the retina, in the choroid or the sclera. Immediately after the injury the foreign body may be covered with blood, and as the hemorrhage becomes absorbed organization of exudate may take place. If the metal is retained long siderosis develops. The degree of reaction in the fundus varies with the size of the body, the force of contact and whether the object was infected.

When the foreign body is copper it causes the characteristic retinal change of small discrete paramacular yellow spots. These may become less evident, but if the foreign body cannot be removed the reaction increases and the deposits become larger.

Wood splinters provoke a severe exudative inflammation, while glass induces little reaction.

It is obviously impossible to do more than suggest some of the changes in a paper of this size. When the foreign body is lodged in the sclera the resulting hole in the retina may lead to detachment, but if the foreign body is removed and the detachment treated the results are favorable. It must not be forgotten that a foreign body may enter one side of the eye, strike the retina and rebound to the other and produce some unusual scars.

DETACHMENT

Only a summary statement is made regarding traumatic retinal detachments, for there are as yet no absolute pathognomonic signs which distinguish those of spontaneous origin, such as occur in the myope, the gravid woman or the person with a malignant neoplasm of the uveal tract, from those ascribed to physical strain.

Isolated perimacular retinal edema and preretinal edema have been called detachment. Attention to the distinguishing sharp reflex lines from the retina in the former and from the vitreous in the latter are important aids in differentiation. Furthermore, the clinical course is entirely different, for with detachment there is usually progression, whereas with retinal edema the area may enlarge but soon contracts, while with preretinal edema the dome of the swelling expands rapidly, then flattens and disappears. Shallow, flat, finger rolls of detachment are easy to differentiate from the bands caused by folds in the retina because of the irregularity of direction and size as well as the gray color, for folds are more often streaklike and of a yellow tinge. Large globus detachments are easily recognized as they wave on motion of the eyeball, for they have wrinkles in the surface and dull reflexless retinal vessels. The literature is replete with details concerning retinal detachments, so that it is not included.

The retinal vessels may pass over great rents in the retina without change in direction and often are so taut that they indent the lips of the tear, or they may be torn, causing hemorrhage and eventually changes in their caliber.

CHOKED DISK

• The diagnostic value of increasing edema of the disk has been previously stressed, for rising intracranial pressure must be reduced or serious progressive damage to the optic nerves will follow. Again I urge more care and more frequent study of the fundi in every case of fracture of the skull.

TRAUMATIC ARACHNOIDITIS

In cases of traumatic arachnoiditis a swollen papilla with a crown of blood is sufficiently alarming to demand constant observation. If the papilledema does not quickly subside, surgical measures should be employed. In this connection caution is advised against the promiscuous injection of air for encephalograms, for the subsequent elevation of intracranial pressure may cause papilledema, with a retinal hemorrhage.

A striking confirmation of the fact brought out by Parker's experiments, that papilledema first occurs in the eye with the lower ocular tension, may be observed in the case of a large scleral cut which heals with separated scleral lips and a swollen disk.

Finally, attention is focused on pulsating exophthalmos, either spontaneous or traumatic. Frequently diplopia is the first symptom. Examination discloses the bruit heard over the head, and as the blood vessels dilate the eye bulges forward, the conjunctival vessels become full, the vessels of the lid become tortuous and enlarged and the great orbital vessels form immense blood channels. The fundus is then congested, and the vessels are usually a carmine red and the pulsations forcible. A sign of some prognostic value is the persistence of a definite fundus congestion after fracture of the skull.

SUMMARY

The fundus patterns made by trauma are both numerous and destructive. Those resulting from loss of tissue are holes in the retina and ruptures of the choroid.

Those from disturbed circulation include holes, macular pigmentations, chorioretinitis and embolisms.

The special inflammatory reactions are retinitis proliferans and scars.

Actual cutting includes avulsion of the optic nerve, and the result of pressure on the nerve either in the orbit, the bony canal or the brain is papilledema or atrophy.

The nontraumatic changes are contrasted with those caused by injury.

CONCLUSIONS

An ophthalmoscopic examination is imperative in every case of injury to the head or the eye.

Meticulous care should be taken in the original description of each case, special notations being made regarding the time interval, the type of injury and, if possible, the direction of the force and the end result. Obviously, no report is complete without a clear photograph.

Every patient presents a complicated individual condition which demands an exact diagnosis based on a comprehensive knowledge of the possibilities.

The aim of all examinations is to establish whether the changes are traumatic or nontraumatic, for the maintenance of the delicate balance of justice must rest on the sure foundation of knowledge, not on bias.

ABSTRACT OF DISCUSSION

DR. PARKER HEATH, Detroit: As Dr. Bedell has pointed out, differentiation of trauma from other similar lesions is becoming increasingly important with the spread of compensation laws. The point made in the detachment of the retina of differences in color in the background in patches is important. In an organ whose tissues have such concentrated importance as in the eye, not infrequently the initial lesion is less important than the subsequent inflammatory repair. The effect of trauma to the eye is poorly classified in literature. There would seem to be three main approaches to the subject: 1. Clinical study with case notes, repeating these studies so that the whole course of the disease can be noted. This study is of immense value and is the method chiefly emphasized by those reporting their studies in atlas and in literature. An advance in this field will be made by more correlation with the clinicians, as shown by the studies of Wagener, a cheaper fundus camera and color photography with a film which will not fade. An example of case study, though incomplete, is that found in Lagrange's book describing war injuries, wherein he attempts to show the effect of missiles striking near the eye and taking a certain course; also the results from exposure to explosive forces. 2. The second form of study is that of correlating physiology and pathology with the changes in the eyes, using the same methods. An attempt along this line is a correlation of histopathology in the atlas of Guist, and a valuable correlation of histology and clinical data is that of Temple University. This attractive field has scarcely begun to be explored, although the source of material is as common as the general autopsies. The difficulty here is the effort involved—especially the studies of the eye before death. 3. The third field, still less explored, is that concerning the changes in the fundi from trauma in experimental studies. The possibilities here are great for adding valuable knowledge. I would close with the plea that, in addition to such fine clinical studies as Dr. Bedell's, other correlated ophthalmoscopic findings with pathology and physiology of the eye and also more experimental studies be undertaken in the field of ocular trauma.

DR. MORRIS DAVIDSON, New York: There are two aspects to the presentation by Dr. Bedell: The first is the place of fundus photography in ophthalmology. The splendid series of photographs leaves no doubt as to its value for teaching purposes. Photographic documentation for medicolegal purposes is also of great advantage. There are apparent limitations. One is the small area a fundus camera takes in. Furthermore, in the whole series of slides there wasn't one peripheral fundus

lesion. Evidently the camera finds it difficult to pick up the peripheral fundus lesion. The fundus is a large area, and it is misleading for the student to see the small posterior pole of the fundus instead of the whole fundus. Every ophthalmologist should practice some method of graphic recording of his observations. Every one of us makes some kind of a crude sketch of an observation. The available record forms have never been satisfactory, and out of my own needs I have evolved a topographic chart for recording eye injuries for the New York State Department of Labor. My colleague Dr. Goldberg, at the New York State Department of Labor, and I have tested ourselves as to our ability to identify a particular fundus lesion etiologically, without the benefit of a complete eye examination, including a slit lamp study of the anterior segment, and without the help of the concept of the anterior segment contusion syndrome. We were greatly disappointed in our diagnostic skill. It is in contusions where most of the controversies as to the traumatic or nontraumatic etiology of eye lesions occur. I should like to call attention to the reality and value of this syndrome. It consists in a train of lesions, anatomically related, in the pupils, iris, lens, vitreous and fundus periphery. Not every contusion presents all lesions, but two or more are found in every case.

DR. M. M. CULLOM, Nashville, Tenn.: I wish to express my gratitude to Dr. Bedell for his great work on the fundus and the beautiful way he has pictured it. I also want to ask his opinion, and yours, about a medicolegal case. A year ago a man came into the office with a history that while at work he and several of his co-workers were lifting a heavy timber. One of the men slipped and threw almost the whole weight of the timber on him, causing him to make a great effort to hold it up. In a few minutes he said "I can't see out of my right eye." On examination two days later he presented a picture of an embolus in the central artery. I gave it as my opinion that it was the strain that brought about the embolus. I was called to court to testify in this case. I consulted all the books I had in the office, and not one of them gave such a cause for embolus. The lawyer asked me whether I knew any authority that backed up my opinion. I couldn't answer that question very well. However, I found later that Adams Frost gives strain as a cause for embolism of the central artery. Dr. Bedell brought out the question of trauma in connection with embolism of the central artery. A week ago a man of 55 came in with a perfect picture of embolus. His history was that he had been on a spree for a week and had gone to the hospital to sober up. I had the man carefully examined and every test that we made was negative. His heart and blood vessels and tension were normal. The urinalysis was normal and Wassermann reaction was negative. There was nothing we could find that might account for it.

DR. ARTHUR J. BEDELL, Albany, N. Y.: I wish to thank Dr. Heath for reading the paper carefully, and for his timely discussion. It is very important that we keep in mind the suggestions made by Dr. Heath in relation to the study of clinical material, and particularly the correlation of the physiologic and pathologic findings. If we are to make experimental studies, then the results should be photographed and interpreted by a competent examiner. I appreciate Dr. Davidson's discussion, but as the subject is only fundus lesions I will not speak about the anterior segment syndrome. Photographs are made most often of central lesions, but that does not mean that we cannot take pictures of the fundus periphery. Dr. Davidson's diagram showed only the central field. Dr. Cullom reports an interesting clinical case. The patient lifted a heavy weight and immediately went blind. I believe Dr. Cullom can honestly and fairly go before the court and say that the blindness was caused by the exertion of lifting the great weight. In closing I will quote one paragraph, for it is very vital: "The aim of all examination is to establish the truth as to whether the changes are traumatic or nontraumatic, for the maintenance of the delicate balance of justice must rest on the sure foundation of knowledge, not bias."

RADIATION THERAPY IN CARCINOMA OF THE LUNG

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NEW YORK

Radiation therapy for primary carcinoma of the lung has not been effective as a curative agent. However, its usefulness in palliation and in prolonging life should not be overlooked. Even in these spheres the value of radiation therapy has been challenged. Overholt¹ of the Lahey Clinic believes that radiotherapy shortens the life of patients with cancer of the lung; Portmann² of the Cleveland Clinic states that radiotherapy may result in symptomatic relief but not in prolongation of life, while Craver³ of the Memorial Hospital, on the basis of 178 cases, reports that radiation therapy gives symptomatic relief and prolongs life.

TABLE 1.—The Relationship Between the Histologic Classification and Sex Incidence

Sex	Epidermoid Carcinoma		Adenocarcinoma		Anaplastic Carcinoma		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Male.....	94	90	27	54	29	75	150	78
Female.....	11	10	23	46	8	24	42	22
Total	105		50		37		192	

TABLE 2.—The Duration of the Disease from Onset of Symptoms to Diagnosis for the Various Histologic Types

Cases *	Histologic Type	Irradiated		Not Irradiated	
		No. of Cases	Months	No. of Cases	Months
102	Epidermoid.....	41	6	61	8.5
50	Adenocarcinoma.....	10	4	34	6
37	Anaplastic.....	11	4	26	4
189	Weighted average.....	62	5.5	121	5.7

* Three patients were excluded—2 had pneumonectomies and the third an early lesion giving no symptoms and accidentally discovered at autopsy.

The present report based on an analysis of 192 treated and untreated primary carcinomas of the lung which had been examined post mortem at Montefiore Hospital from 1921 to 1939, demonstrates the value of radiation therapy in prolonging life. It was felt that autopsy material permitted a more accurate estimate of the influence of radiotherapy on the duration of life, especially as a comparison was possible between treated and untreated patients.

MICROSCOPIC CLASSIFICATION

The cases were divided into three groups according to the microscopic character of the tumor. Of the 192, 50 were classified as adenocarcinomas, 105 as epidermoid carcinomas and 37 as anaplastic carcinomas (table 1). The adenocarcinomas included types forming mucus (fig. 1), and those not forming mucus (fig. 2). The epidermoid carcinomas were either the

From the Department of Radiation Therapy, Montefiore Hospital.
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Dr. Maurice Lenz gave the author many helpful suggestions; Dr. David Marine gave his permission to use this material, and Dr. Samuel Rosen assisted in classifying the specimens.
1. Overholt, R. H.: Curability of Primary Carcinoma of Lung; Early Recognition and Management, *Surg., Gynec. & Obst.* 70: 479 (Feb. No. 2 A) 1940.
2. Portmann, U. V.: Cleveland Clin. Quart. 7: 119 (April) 1940.
3. Craver, L. F.: Bronchiogenic Carcinoma, *Am. J. Roentgenol.* 43: 469 (April) 1940.

typical squamous cell keratinizing carcinoma (fig. 3) or the nonkeratinizing or basal cell type (fig. 4). The anaplastic group consisted of the spindle cell variety (fig. 5) and the round cell type (fig. 6). Occasionally the classification was difficult because two or more

(table 3). The survival period was longest in epidermoid carcinoma: sixteen and one-half months for the irradiated and eleven months for the nonirradiated patient. It was shortest in adenocarcinoma: eleven months for the irradiated group and seven and one-half months for the nonirradiated group.

The effectiveness of radiotherapy in prolonging life is further illustrated by a comparison between the number of treated and the number of untreated patients

TABLE 4—Effect of Irradiation on the Survival Period

	Histologic Type							
	Epidermoid Carcinoma		Adenocarcinoma		Anaplastic Carcinoma		Total	
	Irradiated	Not Irradiated	Irradiated	Not Irradiated	Irradiated	Not Irradiated	Irradiated	Not Irradiated
Number surviving more than one year	23	16	5	6	6	4	34	26
Per cent surviving more than one year	56	30	31	18	55	21	50	21

alive more than one year after the onset of symptoms. As seen in table 4, 50 per cent of the irradiated group were alive at the end of one year, while 21 per cent of those not given radiation therapy survived this period.



Fig 1—Adenocarcinoma, mucus forming

histologic types were present in the same tumor, and even in the same microscopic field. Classification of these cases was determined by the predominating microscopic characteristics of the tumor.

TABLE 3—Period in Months Between Onset of Symptoms and Death

Cases	Histologic Type	Irradiated		Not Irradiated	
		No of Cases	Months	No of Cases	Months
102	Epidermoid carcinoma	41	16.5	61	11.6
50		16	11	34	7.5
7		11	13.5	26	7.7
183		68	15.0	121	10.0

DURATION OF DISEASE WITH AND WITHOUT IRRADIATION

A comparison was made between the irradiated and the untreated patients. There were 121 untreated and 68 irradiated patients. In both the treated and the untreated patients an average period of five and one-half months elapsed between the onset of symptoms and the diagnosis, as seen in table 2. This period was somewhat longer for the epidermoid carcinoma.

The average duration of life from onset of symptoms to death for the irradiated patients was fifteen months and for those not given irradiation only ten months



Fig 2—Adenocarcinoma, nonmucus forming

THE RELATIONSHIP OF TUMOR DOSE TO SURVIVAL PERIOD

The voltage, target skin distance, filter, size and number of portals, dose and interval between treatments varied from case to case, depending on the extent of the lesion and the general condition of the patient. Since

there were so many variables, the treatment is best described by giving the total dose received by a definite point in the affected lung. An arbitrary point was chosen located 10 cm. from the anterior, posterior and

group the number of cases is too small to make a positive statement, but the results suggest the survival period increased with increasing dosage.

METASTASES AND INFECTION

The method of treatment and the end results were influenced by the condition of the patient and the pres-

TABLE 6.—Metastases to Various Organs

Organ	Epidermoid Carcinoma		Adenocarcinoma		Anaplastic Carcinoma	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Liver.....	29	28	27	54	18	49
Lungs.....	20	19	23	46	9	24
Adrenals.....	21	20	22	44	16	43
Kidney.....	14	13	14	28	7	19
Pleura.....	18	17	16	32	9	24
	13	12	15	30	10	27
	2	2	3	6	2	5
Brain.....	8	8	4	8	2	5
	6	6	14	28	3	8
	7	7	2	4	1	3
	5	5	6	12	2	5
Spleen.....	7	7	9	18	3	8
	1	1	2	4	..	..
	3	3	5	10	..	..
	4	4	5	10	4	11
Pancreas.....	3	3	5	10	4	11
	2	2	3	6	5	14
	1	1	2	4	..	..
	..	..	1	2	1	3
	..	..	4	8	1	3
Parathyroid.....	..	..	1	2	..	..
Skin.....	12	11	3	6	6	16

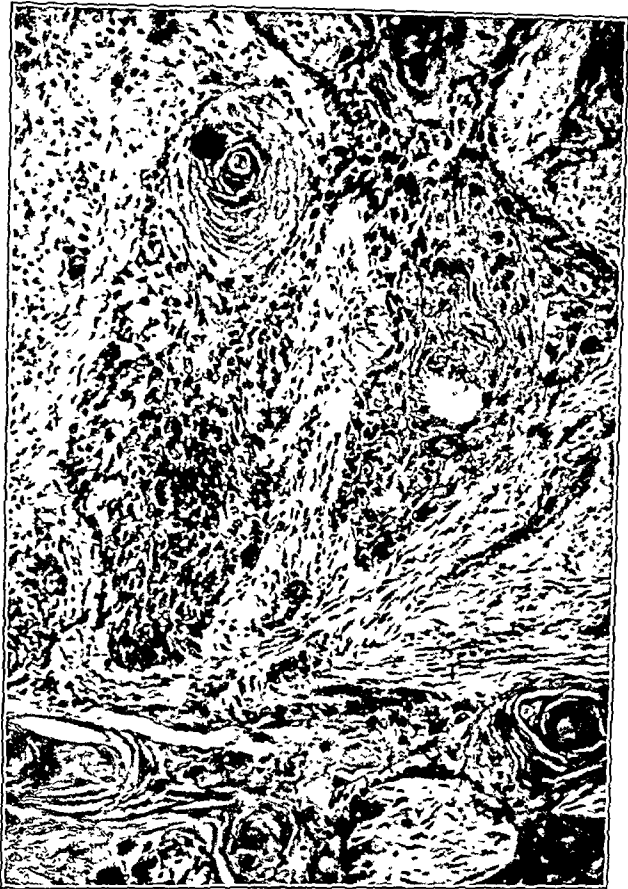


Fig. 3.—Squamous cell carcinoma, keratinizing.

lateral walls of the chest. The dose delivered to this region was called the tumor dose. In most cases this point will lie somewhere within the tumor. It should be understood that the tumor dose is an approximation. Table 5 shows the relationship of the tumor dose to the

TABLE 5.—Relation of Tumor Dose to Survival Period

	Dose in Roentgens						
	0-1,000	1,001-2,000	2,001-3,000*	3,001-4,000	4,001-5,000	5,001-6,000	6,001-7,000
Number of cases *.....	12	14	13	9	7	7	1
Average survival in months.....	10.5	11.5	12	13	14	22	12

* One patient whose case is not included here survived fifty-one months.

survival period in cases in which roentgen treatment was given. As the tumor dose increases there is a definite and progressive increase in the survival period. When the tumor dose was 1,000 r or less, the survival period was about the same as in the untreated group. As the tumor dose was increased, the average survival period was lengthened. With from 1,000 to 2,000 r, the survival period was eleven and one-half months; with from 2,000 to 3,000 r, twelve months; with from 3,000 to 4,000 r, thirteen months; with from 4,000 to 5,000 r, fourteen months, and with from 5,000 to 6,000 r, twenty-two months (table 5). For each dosage



Fig. 4.—Squamous cell carcinoma, nonkeratinizing.

ence of distant metastases. As seen from tables 6, 7 and 8, carcinoma of the lung gives rise to widespread metastases to the skeletal system as well as to all other parts of the body. There was relatively only a small

number of patients in whom the disease remained local. At autopsy 92 per cent of the adenocarcinomas and anaplastic carcinomas had distant metastases. This would indicate that there is little chance for successful

advanced. Since the general health of the patients is poor, they are often unable to withstand a course of vigorous radiotherapy. Some degree of palliation for a period of from one to thirteen months was obtained by 17 of the 38 patients who received their entire treatment at Montefiore Hospital. The symptoms most frequently relieved were cough, expectoration, hemoptysis and pain in the chest.

SUMMARY

1. An analysis of the findings on 192 patients with primary carcinoma of the lung who were examined post

TABLE 8.—Skeletal Metastases *

Bone	Epidermoid Carcinoma		Adenocarcinoma		Anaplastic Carcinoma	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Ribs.....	21	20	9	18	8	22
Spine.....	13	12	12	24	12	32
Pelvis.....	10	9	4	8	..	..
Skull.....	3	3	4	8	3	8
Scapula.....	7	7	..	..	..	..
Clavicle.....	2	2	2	4	1	3
Femur.....	4	4	1	2	..	..
Tibia.....	2	2	..	..	..	..
Fibula.....	1	1	..	..	..	..
Humerus.....	1	1	..	..	..	..
Mandible.....	..	..	..	..	1	3
Sternum.....	1	1	..	..	..	..

* Thirty-four per cent of all patients had skeletal metastasis. Only 3 per cent had metastasis of the osteoplastic type.

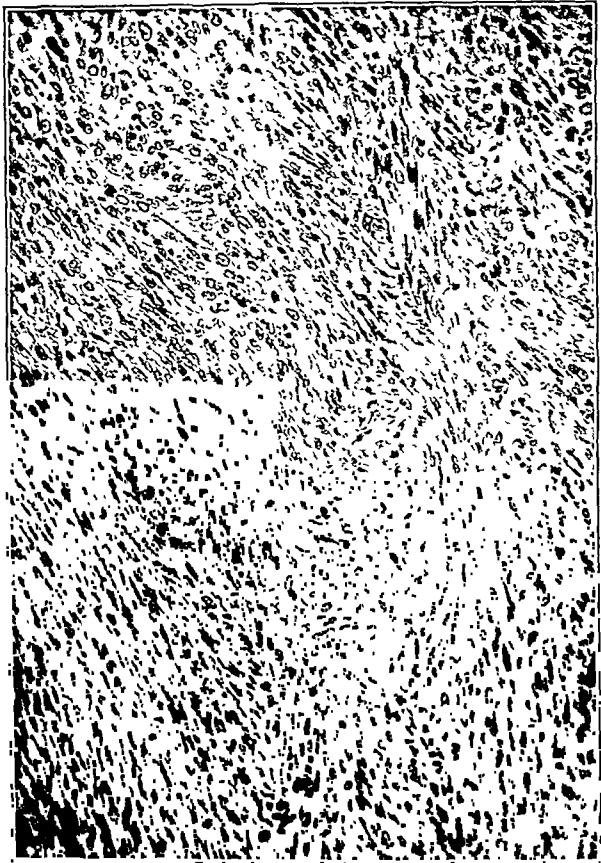


Fig. 5.—Anaplastic carcinoma, spindle cell.

therapy in these two groups. The possibilities appear to be greater in the epidermoid group, as one third of these patients had no distant metastases at autopsy. Unfortunately, epidermoid carcinoma is frequently associated with local infection. It is an exuberant intra-

TABLE 7.—Metastases to Lymph Nodes

Region	Epidermoid Carcinoma		Adenocarcinoma		Anaplastic Carcinoma	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Hilar nodes.....	62	60	32	64	29	79
Cervical glands.....	12	11	14	28	8	22
Axillary glands.....	3	3	4	8	2	5
Inguinal glands.....	2	2	3	6	..	..
Retropertitoneal.....	3	3	7	14	10	27

bronchial growth frequently occluding the bronchus early, with resultant atelectasis, retention of secretions and infection. The tumor even in the very early stages has a tendency to undergo central necrosis and liquefaction. At autopsy, abscess of the lung was present in about 50 per cent of the cases of epidermoid carcinoma, whereas in the adenocarcinoma group there was only 9 per cent, and in the anaplastic carcinoma group 18 per cent.

SYMPTOMATIC RELIEF

Carcinoma of the lung is an insidious disease, and when the diagnosis is made the disease is usually



Fig. 6.—Anaplastic carcinoma, round cell.

mortem at Montefiore Hospital was made to determine the effect of radiation therapy.

2. The tumors were classified histologically as epidermoid, adenocarcinoma and anaplastic carcinoma.

3. In one third of the cases of epidermoid carcinoma there were no distant metastases, while in those of adenocarcinoma and anaplastic carcinoma there were distant metastases in 92 per cent of the cases.

4. The survival period of irradiated patients was on an average five months longer than that of patients not so treated.

5. Twice as many irradiated as nonirradiated patients survived more than one year.

6. The greater the tumor dose delivered within specified limits, the longer was the survival period.

7. Symptomatic relief was obtained by 45 per cent of the patients treated at Montefiore Hospital.
1120 Park Avenue.

EXPERIMENTAL EVIDENCE FOR HISTAMINE RELEASE IN ALLERGY

GERHARD KATZ, M.D.

AND

STANLEY COHEN, M.D.

NEW ORLEANS

It has long been assumed that histamine plays a role in allergic reactions and that it may in part be responsible for many of the clinical symptoms in allergy. The actual experimental evidence for this hypothesis, however, is meager and circumstantial. It is, on the whole, based on the similarity between the allergic and the histamine cutaneous reactions and on some similarities between allergic attacks and the systemic effects of histamine injections. To our knowledge, the presence of a histamine-like substance after application of allergen to tissues from sensitized patients has not been demonstrated convincingly.

An experimental approach to the study of histamine release in allergy suggested itself from observations on anaphylaxis which one of us has made recently.² It was found that blood cells from sensitized animals released part of their histamine into the plasma when brought into contact in vitro with the antigen. Extensive experimentation has made it probable that the amount of histamine released from tissues goes, to a certain extent, parallel to the intensity of the functional disturbances of the animal in anaphylactic shock.³ It had seemed therefore justifiable to consider as a working hypothesis that the in vitro histamine release by blood cells from sensitized animals is an indicator of the degree of the animal's sensitization. This assumption was substantiated in experiments in which the degree of blood histamine release was correlated with the capacity of the animals to undergo shock. Since this method of producing in vitro shock of blood cells and determining the resulting histamine release is quali-

tatively and quantitatively accurate and dependable and allows one to experiment on one individual over unlimited periods of time without endangering life or disturbing the state of sensitization, an attempt was made to apply it to allergic patients.

EXPERIMENTAL OBSERVATIONS

When venous blood from a nonallergic individual was incubated with extract of allergen (giant ragweed, timothy or house dust) at 37 C. for fifteen minutes, no change in plasma histamine was observed. When, however, blood from a patient sensitive to the allergen was subjected to the same procedure, the plasma histamine level rose considerably. From 75 experiments on blood from 18 patients, the accompanying table shows some representative results. This reaction is apparently specific. Blood from a patient, for instance, who is clinically sensitive only to ragweed and not to timothy showed an increase in plasma histamine only on incubation with ragweed and not with timothy extract. The amounts of allergen used in these experiments were supramaximal; that is, they were kept higher than was necessary to effect the greatest possible plasma histamine rise. The source of the increased plasma histamine in this in vitro shock is the cells and not the plasma. Incubation of the sensitized plasma with the allergen left the histamine level unchanged.

Plasma Histamine Values After Incubation of Heparinized Blood with Locke's Solution ("Control") and Giant Ragweed Extract ("Shock") for Fifteen Minutes at 37 C.

No.	Condition of Patient	Date	Plasma Histamine in Micrograms of Base per Cubic Centimeter After Incubation of Blood with		
			Locke's Solution	Ragweed Extract	Increase
1	"Normal"; no evidence for allergy	1/29/41	0.013	0.015	15%
2	Ragweed and house dust allergy	3/24/41	0.020	0.032	60%
3	Ragweed and house dust allergy	10/28/40	0.019	0.051	168%
4	Ragweed allergy.....	3/ 7/41	0.004	0.036	650%
		10/ 9/40	0.050	0.14	189%
		10/22/40	0.013	0.040	259%
		4/28/41	0.005	0.050	900%
5	Ragweed allergy.....	2/ 9/41	0.003	0.030	900%
		2/14/41	0.014	0.040	186%
		3/ 3/41	0.017	0.030	76%

The ragweed extracts were free from detectable histamine. The volume of the solutions added to blood was 10 per cent of the sample. Usual over-all error of histamine estimation was ± 15 per cent.

According to our findings thus far, the histamine release from blood cells in the allergic in vitro shock varies greatly when a patient's blood is examined at different times. It seems to go parallel to the capability of the patient to have clinically manifest allergy. It does not regularly go parallel with the degree of response to the intradermal test.

COMMENT

This report is not concerned with studies of the role of histamine in different clinical allergic pictures. It is only intended to prove that, as far as blood cells are concerned, the cellular allergic reaction is histaminergic. The amounts of histamine released from blood cells on contact with the allergen could be large enough to be biologically significant in vivo. We may assume that at least at points of high concentrations of allergens, such as tissues of the respiratory or digestive tracts, the histamine released from blood cells

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Aided by a grant from the John and Mary R. Markle Foundation (to G. K.). The authors were given invaluable technical assistance by Miss Marguerite Magee.

1. In this report the term "histamine" is used in preference to "histamine-like substance." It is a substance which has been extracted by the method of Barsoum and Gaddum (Code, C. F.: The Quantitative Estimation of Histamine in the Blood, *J. Physiol.* 89: 257 [April] 1937) and assayed biologically on the isolated atropinized guinea pig's ileum.

2. Katz, Gerhard: Histamine Release from Blood Cells in Anaphylaxis in Vitro, *Science* 91: 221 (March 1) 1940; The Role of Blood Cells in the Anaphylactic Histamine Release, Dragstedt, C. A.: The Relationship of Histamine to Anaphylaxis in the Rabbit, *Science* 91: 617 (June 28) 1940.

3. Code, C. F.: The Histamine Content of the Blood of Guinea Pigs and Dogs During Anaphylactic Shock, *Am. J. Physiol.* 127: 78 (Aug.) 1939. Ojers, G.; Holmes, C. A., and Dragstedt, C. A.: The Liver Histamine in Canine Anaphylaxis, *J. Pharmacol. & Exper. Therap.* 72: 30 (May) 1941. Katz, G.

circulating through these areas should, to a certain extent, contribute to some of the local tissue reactions. The possibility of remote action should also be kept in mind. It is conceivable that histamine is released systemically from circulating blood cells after they have come into contact with allergen at the allergic ports of entry. It should be pointed out that histamine is not necessarily the only active humoral principle which is released or formed in antigen-antibody reaction. In the anaphylactic *in vitro* shock of blood, for instance, one of us found at least one active substance appearing in the plasma, with chemical and biologic properties different from histamine.⁴

If one can accept the hypothesis that the *in vitro* histamine release from blood goes to a significant degree parallel to the extent to which the patient's tissues show allergic reactions in spontaneous or induced attacks, then one is offered the possibility of investigating, by this method, allergic states comparatively accurately in controlled experiments. As pointed out, our observations so far support this hypothesis.

Clinical Notes, Suggestions and New Instruments

THE RELATIVE EFFECTS OF SEVERAL SUBSTANCES IN MINIMIZING IRRITATION CAUSED BY ADHESIVE PLASTER

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Feeling that the degree and amount of irritation produced by adhesive plaster might be minimized by attempting to protect the skin before its application with certain substances, I carried out the series of observations presented in this paper. Previously the investigation of this phenomenon had been directed chiefly toward an effort to determine the factors involved in its production. This was done, undoubtedly, with the object of removing from the plaster the irritants which caused the irritation. Apparently it is impossible to remove these irritants without reducing the effectiveness of the plaster so far as its adhesive properties are concerned.

Schwartz and Peck¹ in 1935 concluded as a result of their studies that the chief irritants were resins and smoke-cured wild rubber and that irritation was due partially to hypersensitivity to one of these ingredients. However, they also felt that some irritation resulted from maceration of the skin from application and removal of adherent material.

Grolnick² in 1936 concluded that specific sensitivity was present in only a small number of persons. In fact, only 2 such persons out of 275 tested were found. However, some irritation was noted in 1 out of 6 subjects. Further study by Grolnick in 1940³ seemed to prove in 48 subjects by means of the patch test that specific dermatitis was even less common and that a certain amount of nonspecific irritation could not be avoided.

Forty-six different persons were used for this study. The strappings were always of the lower part of the back, and the area strapped was approximately 7 inches by 15 inches. In each instance the area to be strapped was divided into four squares. One of these was not painted, for a control. The others were painted with compound tincture of benzoin, merthiolate and metaphen. The latter two substances were each in a 50 per cent alcohol, 10 per cent acetone solution, and they will subsequently be referred to as solutions A and B. In each

instance the strappings remained in place for one week, at which time the observations were made. The sites of the squares were varied, so that the square treated with benzoin, for instance, was at one observation in the middle of the field to be strapped and at another on the edge. The reactions of the skin were classified as normal, that is, without any evidence of reaction; erythematous irritation; pustular irritation; bleeding, and vesicles.

Seven of the 46 subjects, or 15.2 per cent, showed no reaction in any of the squares; 36, or 78.3 per cent, showed reaction in one or more of the squares, and 3, or 6.5 per cent, showed reaction in all four squares. The latter subjects may have represented instances of specific hypersensitivity. Since there were four squares on each person, 184 observations were represented. Of these, 106, or 57.6 per cent, were negative, while 78, or 42.4 per cent, showed some irritation. Of the squares showing no reaction 50, or 47.2 per cent, were on edges and 56, or 52.8 per cent, were in the middle, indicating perhaps that the edges were slightly more subject to tension trauma.

Table 1 shows the number of reactions in the squares treated with the three solutions and in those left untreated. From this it will be seen that the greatest number occurred in the untreated squares and that the least number occurred in those treated with solution A.

Table 2 shows the number and percentage of the different types of reactions observed.

Table 3 analyzes the method of treatment of the areas in the causation of each type of reaction. It will be seen that solution A produced the smallest number of irritation reactions. The greatest number of pustular irritations was seen in the squares treated with solution B.

SUMMARY AND CONCLUSIONS

It is felt that this series of observations shows definitely (1) that a certain amount of cutaneous irritation will be present under adhesive strapping; (2) that painting the skin before the adhesive is applied with any one of the three solutions

TABLE 1.—Distribution of Squares Showing Reactions

Treated with	Number	Per Cent
Solution B.....	19	24.4
Untreated.....	23	29.5
Solution A.....	16	20.5
Tincture of benzoin.....	20	25.6

TABLE 2.—Types of Reactions

	Number	Per Cent
Erythematous irritation.....	56	71.8
Pustular irritation.....	8	10.3
Bleeding.....	9	11.5
Vesicles.....	5	6.4

TABLE 3.—Distribution of Types of Reactions

Treated with	Erythematous		Pustular		Bleeding		Vesicles	
	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Solution B.....	13	16.7	4	5.1	2	2.6	0	0
Untreated.....	15	19.2	3	3.8	3	3.8	2	2.6
Solution A.....	11	14.1	1	1.3	2	2.6	2	2.6
Tincture of benzoin.....	17	21.8	0	0	2	2.6	1	1.3

used in this study will lessen the number of reactions; (3) that skin treated with solution A will show fewer reactions than skin treated with either of the other two solutions, and (4) that in the largest group of reactions—that of erythematous irritation—skin treated with solution A will show the lowest percentage of reactions.

2939 Summit Street.

4. Katz, Gerhard: The Role of Blood Cells in the Anaphylactic Histamine Release, *J. Pharmacol. & Exper. Therap.* 72: 22 (May) 1941.

1. Schwartz, Louis, and Peck, S. M.: *Pub. Health Rep.* 50: 811-819 (June 14) 1935.

2. Grolnick, Max: *J. Allergy* 7: 556-570 (Sept.) 1936.

3. Grolnick, Max: *Am. J. Surg.* 50: 63-78 (Oct.) 1940.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

PHENYLMERCURIC COMPOUNDS

Phenylmercuric chloride and basic phenylmercuric nitrate were the first of the organic mercurial compounds of their type found to possess effective bacteriostatic and bactericidal activity against certain pathogenic micro-organisms. Evidence to indicate that other phenylmercuric salts are similarly effective suggests that the activity of such compounds is primarily attributable to the phenylmercuric ion. In general, phenylmercuric salts are highly dissociable in solutions to provide phenylmercuric ions, effective concentrations of which are dependent on the widely varying solubility of the salts employed. In acid, neutral or slightly alkaline solutions, chlorides, bromides, iodides and soaps react with phenylmercuric ion to precipitate a phenylmercuric salt. Phenylmercuric chloride is soluble only to the extent of 1 part in 20,000 of water, the bromide is still less soluble and the iodide is quite insoluble. For this reason the chloride has been supplanted by the more soluble basic phenylmercuric nitrate and other salts.

The phenylmercuric radical ($C_6H_5Hg^+$) is more stable in acid than in alkaline solutions of its salts. Aqueous solutions containing phenylmercuric ions, buffered with inorganic or organic acids, are fairly stable. In the presence of organic solvents the stability is lowered but is still relatively good. Because of the fact that buffered solutions of phenylmercuric salts are more stable and also less irritating to tissue than unbuffered solutions, the former are preferable for pharmaceutical purposes. In general, the buffered solutions are stainless, colorless, odorless, without action on rubber, do not react with the body proteins and are noncorrosive to the common metals other than aluminum, except as these properties may be influenced by the particular acid employed. Solutions of phenylmercuric salts may develop increasing amounts of mercuric and mercurous ions or free mercury, as the result of gradual decomposition of phenylmercuric ions.

There is evidence to indicate that phenylmercuric compounds are of comparatively high germicidal and inhibitory value against a variety of pathogenic bacteria and of relatively low toxicity to human tissue. As with the other types of organic mercurial antiseptics, however, they cannot be depended on to kill bacterial spores even after several hours' exposure. The presence of buffered solutions of phenylmercuric salts does not interfere with the precipitin reaction of human serum, the action of complement, the digestive action of pepsin and trypsin or the antigenic power of vaccine; serum proteins are not precipitated and blood is not hemolyzed. Despite their relatively low toxicity, phenylmercuric compounds may produce irritation, "burns" or poisoning in occasional individuals with undue sensitivity. The minimum lethal intravenous dose for rabbits of a 0.067 per cent (1:1,500) aqueous solution of basic phenylmercuric nitrate (buffered with 0.1 per cent boric acid) is 7 cc. per kilogram of body weight. Other evidence indicates that the minimum lethal oral dose for these animals is approximately three times the intravenous dose. The toxicity of solutions of this and other phenylmercuric salts may be expected to vary according to the concentration of phenylmercuric ions, the presence of organic solvents, the acid which is added as a buffer to render them stable and the degree of decomposition. The appearance of metallic mercury as a precipitate in solutions of phenylmercuric salts indicates extensive decomposition.

MERPHENYL NITRATE (BASIC).—Basic Phenylmercuric Nitrate.—A molecular compound of phenylmercuric nitrate and phenylmercuric hydroxide. $C_6H_5HgNO_3 \cdot C_6H_5HgOH$ (F. W. 634.4).

Actions and Uses.—Merphenyl nitrate (basic) is recognized for external use in solution or ointment as an antiseptic for the prophylactic and therapeutic disinfection of the skin, superficial abrasions, lacerations, wounds and infections.

Dosage.—For prophylactic disinfection of the intact skin and minor lesions the 1:1,500 aqueous buffered solutions may be applied full strength; for application to mucous membranes or for the application of wet dressings or continuous irrigation to

wounds, a 1:15,000 to 1:24,000 aqueous solution should be used (prepared by diluting the 1:1,500 buffered solution approximately ten to fifteen times with water). When used as a wet dressing, the 1:24,000 dilution should be prevented from becoming too concentrated, as the result of unavoidable evaporation, by the addition of about 0.5 per cent of sodium chloride. Approximately $\frac{1}{2}$ teaspoon of noniodized table salt to each pint of diluted solution is recommended. This amount of sodium chloride does not produce excessive precipitation. The full strength (1:1,500) solution should never be used to wet bandages or dressings. The 1:1,500 oxycholesterin base ointment may also be employed for the prophylactic disinfection of minor injuries or may be applied twice daily for the treatment of superficial infections.

Manufactured by the Hamilton Laboratories, Inc., Hamilton, Ohio U. S. patent 2,014,676 (Sept. 17, 1935, expires 1952). U. S. trademark 318,039.

Merphenyl Nitrate (Basic) Solution, 1:1,500.—An aqueous solution of basic phenylmercuric nitrate 0.067 per cent (1:1,500), with boric acid 0.1 per cent.

Merphenyl Nitrate (Basic) Ointment, 1:1,500.—A water in oil emulsion ($\frac{2}{3}$ aqueous, $\frac{1}{3}$ oil phase) of an oxycholesterin base containing basic phenylmercuric nitrate 0.067 per cent (1:1,500), with boric acid 0.1 per cent.

Basic phenylmercuric nitrate is an odorless, white, crystalline powder, which melts with decomposition between 175 and 185 C. (extremely pure specimens melt as high as 192 C.). It is soluble (1:200) in glycerin, slightly soluble (1:800) in alcohol and very slightly soluble (1:1,200) in water. Its apparent solubility in water is increased if nitric acid or alkalis are present. Aqueous solutions of basic phenylmercuric nitrate are incompatible with halides, which cause the precipitation of the nearly insoluble halide compounds; e. g., phenylmercuric chloride (C_6H_5HgCl). The pH of a 0.1 per cent aqueous solution of basic phenylmercuric nitrate is approximately 3.7.

Add 3 cc of sulfuric acid to about 0.1 Gm of basic phenylmercuric nitrate, the mixture becomes yellow and the odor of nitro benzene is evolved. Add 1 cc of diluted hydrochloric acid to 5 cc of saturated aqueous solution of basic phenylmercuric nitrate, a white precipitate forms, filter, wash the precipitate with cold water, dry it on a porous plate; the melting point of the product is between 248 and 255 C. Solutions of basic phenylmercuric nitrate respond to the U. S. P. test for nitrate. Add 5 cc of ammonium sulfide solution to 5 cc of a saturated solution of basic phenylmercuric nitrate there is no reaction in the cold; heat the mixture for ten minutes in a boiling water bath; a black precipitate forms.

Add 5 cc of sodium hydroxide solution to 5 cc of a saturated solution of basic phenylmercuric nitrate, no yellow precipitate forms (absence of mercuric ions), the solution does not blacken (absence of mercurous ions). Dissolve 0.1 Gm of basic phenylmercuric nitrate in 150 cc of water, the solution is colorless and clear.

Igute (HOOD) 0.5 Gm of basic phenylmercuric nitrate: the residue does not exceed 0.1 per cent.

Determine the mercury content of an accurately weighed portion of basic phenylmercuric nitrate by a suitable standard method; the mercury content is not less than 62.75 per cent nor more than 63.50 per cent.

Determine the nitrogen content of an accurately weighed portion of basic phenylmercuric nitrate by the micro Dumas method or by the method described in the fifth edition of Methods of Analysis of the Association of Official Agricultural Chemists, page 27, section 27; the nitrogen content is not less than 2.05 per cent nor more than 2.25 per cent.

Determine the phenylmercuric ion content of 0.2 Gm of basic phenylmercuric nitrate dissolved in 90 cc of water and acidified with 10 cc of concentrated nitric acid. Titrate the solution with twentieth normal ammonium thiocyanate, using 2 cc of saturated ferric ammonium sulfate solution as the indicator. Compare the color produced against a blank control containing 0.1 cc of the ammonium thiocyanate solution. Each cubic centimeter of twentieth normal ammonium thiocyanate is equivalent to 0.01389 Gm of phenylmercuric ion; the phenylmercuric ion content found is not less than 87.0 nor more than 87.9 per cent.

MERPHEYL PICRATE TINCTURE 1:200 WITH PICRIC ACID.—Tincture of Phenylmercuric Picrate 1:200 with Picric Acid 12%.—A tincture consisting of acetone 10 per cent, alcohol 50 per cent and water 38.3 per cent, containing phenylmercuric picrate 0.5 per cent with picric acid (trinitrophenol) 1.2 per cent. Phenylmercuric picrate can be considered to have the formula $C_6H_5HgOC_6H_2(NO_2)_3$, although a product of this composition may be difficult to isolate. Solutions which can be considered to contain phenylmercuric picrate may be prepared by the addition of picric acid (trinitrophenol) in appropriate amounts to solutions of phenylmercuric hydroxide.

Actions and Uses.—Merphenyl picrate, in an acetone-alcohol tincture with picric acid, is primarily intended as a prophylactic disinfectant in the preoperative preparation of the intact skin and for recent abrasions, lacerations and wounds. It may also be employed in the treatment of superficial infections, particularly when the drying effect of acetone and alcohol is desired. Owing to its staining quality, the picrate compound is useful to delineate the field or area of application. Picric acid is added in sufficient concentration to provide fair stability, but the amount present is also sufficient to exert some disinfectant action in itself. Because of its high toxicity internally, the possibility of poisoning due to absorption of picric acid from applications of the tincture to large denuded areas of the skin or to mucous membranes should be kept in mind.

Dosage.—For prophylactic preoperative skin preparation, disinfection of soft tissue injuries and the treatment of superficial infections, tincture of phenylmercuric picrate 1:200 with picric acid 12 per cent is applied full strength; in wet dressings or continuous irrigation for infected wounds, a concentration of phenylmercuric picrate not greater than 1:15,000 should be used (prepared by diluting the 1:200 tincture approximately seventy-five times with water). When used as a wet dressing, undue concentration of the diluted solution from unavoidable evaporation should be prevented by the addition of about 0.5 per cent of sodium chloride. Approximately $\frac{1}{2}$ teaspoon of noniodized table salt to each pint of diluted tincture is recommended. This amount of sodium chloride does not produce excessive precipitation. The full strength (1:200) tincture should never be used to wet dressings or bandages.

Manufactured by The Hamilton Laboratories, Inc., Hamilton, Ohio U. S. patent 2,014,676 (Sept. 17, 1935, expires 1952) U. S. trade mark 318,039

Merphenyl picrate tincture 1:200 with picric acid is a strongly yellow colored solution which possesses the odor of acetone and alcohol and a *pH* value of about 2.0 Its specific gravity is between 0.8980 and 0.901 at 25 C.

To 2 cc of merphenyl picrate tincture 1:200 add 2 cc of water and 2 drops of 1 per cent sodium chloride solution a white precipitate, which is soluble in sodium hydroxide and may be reprecipitated by the addition of nitric acid, is formed To 10 cc of merphenyl picrate tincture 1:200 add 2 cc of saturated sodium chloride solution a precipitate forms; filter, wash the precipitate with cold water, dry on a porous plate the melting point of the product is between 248 and 255 C.

To 5 cc of merphenyl picrate tincture 1:200 add 5 cc. of water and 2 cc of diluted nitric acid; extract the solution with three 10 cc. portions of ether; combine the ether extracts, filter through a cotton pledget and evaporate the ether: yellow crystals are obtained which melt at from 120 to 123 C

To 2 cc of merphenyl picrate tincture 1:200 add 2 cc of water followed by 2 cc of potassium iodide solution added a drop at a time; a white precipitate forms in the yellow solution that at no time shows traces of orange or red color and is insoluble in the excess of potassium iodide (*mercuric ions*) To 2 cc of merphenyl picrate tincture 1:200 add an excess of sodium hydroxide solution the solution becomes orange red, but there is no precipitate and the solution does not blacken (*mercurous salts*) To 3 cc of merphenyl picrate tincture 1:200 add 5 cc of sulfuric acid, cool, overlay with a saturated solution of ferrous sulfate, a brown ring does not appear (*nitrate*).

The mercury content of merphenyl picrate tincture 1:200 can be determined by a suitable electrolytic method the mercury content is equivalent to not less than 0.26 per cent nor more than 0.28 per cent of merphenyl ion The merphenyl ion content also may be determined, as directed under merphenyl borate tincture 1:500, after removal by ether extraction of the picric acid from an acidified portion of the tincture (nitric acid)

Caution Merphenyl picrate tincture 1:200 with picric acid is more liable to decomposition on aging than certain other phenylmercuric salts.

MERPHENYL BORATE TINCTURE 1:500.—Tincture of Phenylmercuric Borate 1:500.—A tincture consisting of acetone 4.6 per cent, alcohol 43.2 per cent and water 50 per cent, containing phenylmercuric borate 0.2 per cent, with 1.0 per cent each of boric acid and sodium acid phosphate. Phenylmercuric borate can be considered to have the formula $C_6H_5HgBO_2 \cdot H_2O$, although a product of this composition may be difficult to isolate. Solutions which can be considered to contain phenylmercuric borate may be prepared by the addition of boric acid in appropriate amounts to solutions of phenylmercuric hydroxide.

Actions and Uses.—Merphenyl borate is recognized for use in tincture form for external use as an antiseptic for the prophylactic and therapeutic disinfection of the skin, superficial injuries and wounds. Buffered solutions of this compound are claimed to be somewhat less irritating than certain other phenylmercuric compounds

Dosage.—For prophylactic preoperative preparation of the intact skin, disinfection of recent soft tissue injuries and the treatment of superficial wounds a 1:500 tincture of phenylmercuric borate may be applied full strength; for application to mucous membranes, in wet dressings or continuous irrigation for infected wounds a 1:24,000 concentration should be used (prepared by diluting the 1:500 tincture approximately forty-five times with water). In wet dressings, undue concentration of the diluted solution from unavoidable evaporation should be prevented by the addition of about 0.5 per cent of sodium chloride. Approximately $\frac{1}{2}$ teaspoon of noniodized table salt to each pint of the diluted tincture is recommended. This amount of sodium chloride does not produce excessive precipitation. Dressings and bandages wet with the full strength (1:500) tincture should never be applied.

Manufactured by The Hamilton Laboratories, Inc., Hamilton, Ohio U. S. patent 2,014,676 (Sept. 17, 1935, expires 1952). U. S. trade mark 318,039.

Merphenyl borate tincture 1:500 is a colorless solution which possesses the odor of acetone and alcohol and a *pH* value of about 5.7. Its specific gravity is between 0.920 and 0.940 at 25 C

To 2 cc of merphenyl borate tincture 1:500 add 2 cc. of water and 2 drops of 1 per cent sodium chloride solution: a white precipitate which is soluble in sodium hydroxide and may be reprecipitated by the addition of nitric acid is formed. To 10 cc of merphenyl borate tincture 1:500 add 2 cc of saturated sodium chloride solution: a precipitate forms, filter, wash the precipitate with cold water, dry on a porous plate: the melting point is between 248 and 255 C. Evaporate 5 cc. of merphenyl borate tincture 1:500 on a water bath, cool, add 2 cc of methyl alcohol, ignite the alcohol. The flame is green. To 2 cc. of merphenyl borate tincture 1:500 add 2 cc of water and 1 cc of silver nitrate solution a yellow precipitate forms, soluble in nitric acid

To 2 cc of merphenyl borate tincture 1:500 add 2 cc of water followed by 2 cc of potassium iodide solution added a drop at a time. a white precipitate forms in the solution that at no time shows traces of orange or red and is insoluble in the excess of potassium iodide (*mercuric ions*) To 2 cc of merphenyl borate tincture 1:500 add 2 cc. of water and 2 cc of sodium hydroxide solution: The solution remains clear and does not blacken (*mercurous ions*). To 3 cc. of merphenyl borate tincture 1:500 add 5 cc of sulfuric acid, cool, overlay with fresh saturated solution of ferrous sulfate a brown ring does not appear (*nitrate*).

Transfer 25 cc of merphenyl borate tincture 1:500, accurately measured, to a suitable flask, add 25 cc of water, 10 cc of ferric ammonium sulfate solution and 5 cc of nitric acid, titrate, using fiftieth normal ammonium thiocyanate delivered from a 10 cc buret until the color of the solution matches that of a control containing 50 cc of water, 10 cc of ferric ammonium sulfate solution, 5 cc. of nitric acid and 0.10 cc of fiftieth normal ammonium thiocyanate. Subtract 0.10 cc from the volume noted in the titration, the volume difference is equivalent to not less than 37.5 mg nor more than 42.5 mg of phenylmercuric ion (CoH_5Hg^+). (Each cubic centimeter of fiftieth normal ammonium thiocyanate is equivalent to 5.554 mg of phenylmercuric ion).

SECONAL SODIUM.—Sodium allyl (methyl propyl carbonyl) barbiturate.—Sodium allyl (1-methyl butyl) barbiturate. $CO.Na.CO.NH.CO.C(CH_2:CH:CH_2) [CH(CH_3).CH_2.CH_2.CH_3]$.

Actions and Uses.—The actions and uses of seconal sodium are essentially those of barbitol but it is described as a short-acting barbiturate. It is more active than barbitol and is used in correspondingly smaller doses

Dosage.—The average adult dose is from 0.1 to 0.2 Gm. ($\frac{1}{2}$ to 3 grains). When oral administration is contraindicated, seconal sodium may be administered rectally. Smaller doses of seconal sodium are sedative, larger doses are hypnotic. For use in obstetrics and as a preanesthetic sedative the following dosage has been suggested. In obstetrics, an initial dose of 3 or $4\frac{1}{2}$ grains (0.3 Gm) followed by $\frac{1}{2}$ to 3 grain doses at appropriate intervals up to a total of no more than 12 grains within a twelve hour period; as a preanesthetic agent, 3 to $4\frac{1}{2}$ grains one-half to one hour before the patient is sent to the operating room

Manufactured by Eli Lilly & Co., Indianapolis U. S. patent 1,954,429 (April 10, 1934 expires 1951). U. S. trademark 328,662

Pulvules Seconal Sodium $\frac{3}{4}$ grain (0.05 Gm.)

Pulvules Seconal Sodium $\frac{1}{2}$ grains (0.1 Gm.)

Suppositories Seconal Sodium 2 grains (0.13 Gm.)

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179).

Baxter Laboratories, Inc., Glenview, Ill., and Don Baxter, Inc., Glendale, Calif. (American Hospital Supply Corporation, Chicago, eastern distributor).

Sterile 20% Dextrose W/V in Physiological Solution of Sodium Chloride in Vacoliter Container. Each hundred cubic centimeters contains dextrose U. S. P. 20.00 Gm. and sodium chloride, 0.85 Gm

Sterile 25% Dextrose W/V in Physiological Solution of Sodium Chloride in Vacoliter Container. Each hundred cubic centimeters contains dextrose U. S. P. 25.00 Gm and sodium chloride 0.85 Gm

The several accepted dextrose solutions in physiological solution of sodium chloride, marketed in Vacoliter Containers, are also supplied in Half Size Vacoliter and Double Size Containers.

SCHIEFFELIN'S COD LIVER OIL CONCENTRATE TABLETS.—A cod liver oil concentrate in the form of tablets. Each tablet has a vitamin A potency of not less than 3,120 units and a vitamin D potency of not less than 312 units when assayed by the method of the U. S. P.

Actions and Uses.—Schieffelin's cod liver oil concentrate tablets possess properties similar to those of cod liver oil so far as these depend on the fat-soluble vitamin content of the latter.

Dosage.—For adults, two tablets three times daily; for children, one tablet three times daily, after each meal; for infants, one tablet daily, crushed and dissolved in the feeding.

Manufactured by White Laboratories, Inc., Newark, N. J. (Schieffelin & Co., New York, distributor). The concentrate used is made under U. S. patent 1,984,858 (Dec 18, 1934, expires 1951).

THEOPHYLLINE WITH ETHYLENEDIAMINE (See New and Nonofficial Remedies, 1941, p. 583).

The following dosage form has been accepted:

Tablets of Aminophylline, 0.2 Gm (3 grains)

Prepared by The Lakeside Laboratories, Inc., Milwaukee

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 22, 1941

THE REQUIREMENT FOR CALCIUM

Calcium has manifold functions in the human body, not only as a structural factor in the bones and teeth, but also as a prerequisite to normal neuromuscular action and the clotting of blood. Its unique osmotic importance in the blood has been suggested; it exerts a significant influence on the movement and distribution of other mineral elements in the body. This recognized physiologic prominence of calcium has attracted the attention of investigators for many years. It is not surprising that the distribution and availability, the utilization by the organism and the human requirement are still themes of active interest in metabolism and nutrition.

Although milk with its 0.12 per cent of calcium is considered the best source of calcium, vegetables also contribute this element to the diet. When experimental animals are forced to obtain a considerable proportion of their daily calcium from vegetable sources, the availability of this element is definitely less than when milk is the main source of lime. In a recent report Shields and his co-workers¹ showed that, if the availability of calcium in milk is expressed as 100, carrots, fresh lettuce and string beans have the respective values 85, 80 and 74 in this connection. They conclude that there is something in vegetables which decreases the utilization of the contained calcium over that in liquid or dried milk.

Equally important with the availability of calcium from different foods is the efficiency with which the body can utilize the calcium in an excellent source such as milk. An extensive series of studies² from the University of Illinois has recently provided data bearing on this question in preschool children and also in adult human subjects. In all these experiments the conception of degree of utilization was the relationship between

the net calcium loss to the body on a calcium poor basal ration and the supplementary dietary calcium required to eliminate that net loss. When this method of computation was applied to dried or fluid milk it was found that only about 20 per cent of the calcium in this relatively high calcium food was utilized under the conditions of the study by the children and the adults.

The data on which the foregoing conclusions are based permit the calculation of the calcium requirement of man. Two recent reports³ based on studies of a total of sixteen adults in which milk provided a large part of the calcium show essential agreement in daily calcium requirement, the value being 9.6 mg. per kilogram of body weight from one study and 10.7 mg. from the other. These values are greater than the value which is currently looked on as adequate and which is the basis for estimating the nutritive value of dietary programs with respect to calcium. The considerable reserves of the body suggest that temporary shortage of dietary calcium is not of immediate concern. The newer studies, however, will be of value in long range planning of dietaries and in securing greater insight into the problems of mineral metabolism.

SPARING THE LIVER

Addis and his co-workers¹ found that livers of albino rats lose, after a two day fast, 20 per cent of their original protein content, while the kidney, the heart and all other organs and tissues combined lose 4 per cent. The liver presumably is a depot for stored proteins, which may be used during fasting as glycogen is used during fasting. Goldschmidt, Vars and Ravdin² demonstrated in rats that the incidence and the severity of damage to the hepatic cells twenty-four hours after one hour of chloroform anesthesia increases progressively with an increase in the concentration of lipids in the liver. A high protein diet previous to the anesthesia with chloroform reduced the incidence of hepatic cellular necrosis even in livers with a high lipid content and therefore in the face of a severe attack by chloroform. A high concentration of hepatic glycogen, per se, failed to confer protection against the hepatotoxic action of chloroform with the same concentration of hepatic fatty acids and similar intake of proteins. Protection against hepatic injury following a diet high in carbohydrates is apparently due to the reduction of the lipid content of the liver. Miller and Whipple³ demon-

1. Shields, J. B.; Fairbanks, B. W.; Berryman, G. H., and Mitchell, H. H.: *J. Nutrition* **20**: 263 (Sept.) 1940.

2. Steggerda, F. R., and Mitchell, H. H.: *J. Nutrition* **17**: 253 (March) 1939; **21**: 577 (June) 1941. Kinsman, Gladys; Sheldon, Dorothy; Jensen, Elizabeth; Berns, Marie; Outhouse, Julia, and Mitchell, H. H., *ibid.* **17**: 429 (May) 1939. Breiter, Herta; Mills, Rosalind; Dwight, Julia; McKey, Beula; Armstrong, Williamina, and Outhouse, Julia, *ibid.* **21**: 351 (April) 1941.

3. Steggerda, F. R., and Mitchell, H. H.: *J. Nutrition* **21**: 577 (June) 1941. Outhouse, Julia; Breiter, Herta; Rutherford, Esther; Dwight, Julia; Mills, Rosalind, and Armstrong, Williamina, *ibid.* **21**: 565 (June) 1941.

1. Addis, Thomas; Poo, L. J., and Lew, W.: Protein Loss from Liver During a Two Day Fast, *J. Biol. Chem.* **115**: 117 (Aug.) 1936.

2. Goldschmidt, Samuel; Vars, Harry M., and Ravdin, Isidor S.: The Influence of the Foodstuffs on the Susceptibility of the Liver to Injury by Chloroform, and the Probable Mechanism of Their Action, *J. Clin. Investigation* **18**: 277 (May) 1939.

3. Miller, L. L., and Whipple, G. H.: Chloroform Liver Injury Increases as Protein Stores Decrease: Studies in Nitrogen Metabolism in These Dogs, *Am. J. M. Sc.* **199**: 204 (Feb.) 1940.

strated in dogs that liver injury due to chloroform anesthesia increases in extent as the protein body stores are depleted. Fifteen to twenty minutes of chloroform anesthesia in a protein depleted dog was frequently fatal with extensive liver necrosis and the typical picture of chloroform poisoning, whereas dogs without protein depletion tolerated ninety minutes of chloroform anesthesia with but little liver injury. Messinger and Hawkins⁴ found protein most effective in protecting dogs against injury to the liver from arsphenamine. A carbohydrate diet was beneficial, though to a lesser degree. Fat in the diet has proved deleterious. When fat fed dogs that showed severe intoxication due to arsphenamine were switched to protein or carbohydrate diets they immediately recovered from the intoxicated state, and the icteric index decreased. Johnson, Ravdin, Vars and Zintel⁵ found in dogs that a diet high in protein and carbohydrates and without fat was most effective in reducing the fatty acid concentration of the liver and in increasing the hepatic glycogen in the presence of obstruction of the common duct. The diet gave the same result as the usual high carbohydrate diet in about half the time. These experiments appear sufficiently conclusive to warrant the adoption of a high protein, high carbohydrate, no fat diet in the preoperative preparation of the patient seriously ill with disease of the biliary tract.

Starling emphasized many years ago that the osmotic pressure of the plasma crystalloids is of minor importance in keeping fluids in the blood vessels, for the crystalloids pass freely in either direction through the walls of the blood vessels. As the plasma protein concentration falls from the normal 7.0 to 7.5 Gm. per hundred cubic centimeters, the osmotic pressure exerted by the plasma is reduced and fluid begins to leave the vessels, causing at first a latent and later an evident edema. The common occurrence of edema among the undernourished peoples in the late war is well known. The evidence is clear that the so-called nutritional edema is due to deficient protein intake and consequent hypoproteinemia. The fundamental cause of edema is hypoproteinemia, and the mechanism is that suggested by Epstein; namely, a reduction in the osmotic pressure of the serum protein.

Jones and Eaton⁶ were first to present evidence that nutritional edema is not uncommonly associated with surgical procedures, particularly of the gastrointestinal tract. The prolonged interference with a normal diet occurring with operations for gastric and duodenal ulcer and gastric cancer results frequently in varying degrees of undernutrition. Hypoproteinemia intensifies

edema of trauma naturally occurring at the site of gastrointestinal suture. Under normal conditions of fluid exchange the edema of trauma begins to disappear forty-eight to seventy-two hours after operation, but in the presence of hypoproteinemia it continues to increase during this period, resulting in a mechanical impediment to the forward progress of gastric contents. Ravdin stresses that attempts to restore a normal fluid and electrolyte balance in the presence of hypoproteinemia, without at the same time increasing the colloid osmotic pressure by adding to the plasma, too frequently results only in adding to the extravascular fluid reservoirs. A diet in which 75 to 80 per cent of the total calories come from carbohydrates and 20 to 25 per cent from protein will prove to be the most satisfactory diet. From 2,500 to 3,000 calories should be given for several days prior to operation and resumed as soon as possible after. The most rapid means of correcting protein deficiency is by repeated plasma transfusions. When more time is available, the orojejunal method described by Stengel and Ravdin⁷ is useful.

INTERFERENCE WITH RADIO COMMUNICATIONS

Electromedical equipment may interfere with radio communication. Physicians do not, of course, desire to interfere with radio communications, but owing to the characteristics of the equipment a portion of the energy may escape the apparatus and appear in space as an unwanted radio signal, thus interfering with communications. Although great progress has been made in the construction of x-ray apparatus, the old type of x-ray equipment is still a source of interference. Efforts have been made to solve this problem in the field of diathermy. Cooperation now prevails among the several interested groups, including the Federal Communications Commission, the manufacturers of electromedical equipment, the radio communications interests and the Council on Physical Therapy, which represents the medical profession.

In countries now at war, drastic steps in the control of diathermy machines have had to be taken. The rule here quoted, placed in effect in 1939, applies in England:

The Postmaster General in the exercise of the powers conferred on him by Regulation 55 of the Defense Regulations, 1939, hereby orders that on and after the 25th day of November, 1939, no person shall, except under the authority of a permit granted by the Postmaster General for the purpose, sell, purchase, let, hire, supply, dispose of, acquire or distribute any of the under-mentioned articles:

(c) High frequency equipment (being equipment which generates or uses high frequency current at frequencies greater than 10,000 cycles per second and having a maximum output exceeding 10 watts), including such equipment intended for use in connection with furnaces and medical apparatus.

4. Messinger, W. J., and Hawkins, W. B.: Arsphenamine Liver Injury Modified by Diet. Protein and Carbohydrate Protective, But Fat Injurious, *Am J M Sc* 199: 216 (Feb.) 1940.

5. Johnson, Julian, Ravdin, I. S.; Vars, Harry M., and Zintel, Harold A.: Effect of Diet on Composition of the Liver in the Presence of Obstruction of the Common Bile Duct, *Arch. Surg.* 40: 1104 (June) 1940.

6. Jones, C. M., and Eaton, F. B.: Postoperative Nutritional Edema, *Arch. Surg.* 27: 159 (July) 1933.

7. Stengel, Alfred, Jr., and Ravdin, I. S.: The Maintenance of Nutrition in Surgical Patients, with a Description of the Orojejunal Method of Feeding, *Surgery* 6: 511 (Oct.) 1939.

In Canada the Radio Division of the Department of Transport has issued a pronouncement in the *Canada Gazette* entitled "Suppression of Inductive Interference from Spark Gap Electro-Medical Apparatus," the first paragraph of which reads:

The necessity of protecting radio communications, including those used by the fighting services, as well as broadcast reception, has obliged the Department of Transport to bring in regulations prohibiting, after January 1st, 1942, the use of spark-gap type diathermy apparatus and mechanical rectifiers for x-ray installations, unless such equipment is adequately shielded, thereby confining the radiation within reasonable limits, or their interference otherwise suppressed.

As far as is known, such steps have not been contemplated here in the United States, even in the event of active war. A technical solution is well known and requires merely the application of certain simple techniques employed in all of the various radio services; for example, screening of the equipment or restricting the high frequency electrical energy to definite frequencies. Undoubtedly an increase in cost of equipment will be entailed, which will be the cost of screening or the additional accessories in the apparatus to regulate the frequency.

The Federal Communications Commission is trying to solve this problem not only without having recourse to licensing, as in England, but without creating any condition likely to place a burden on a practicing physician or increase the cost of diathermy treatments to the public. Since the radio channels affected by diathermy operation are invaluable to the armed forces for other national defense uses, and for many important communications services needed to fulfil the requirements of the general public, the medical profession will of course assist in all ways possible to solve this problem.

Current Comment

AMERICAN MEDICAL ASSOCIATION BROADCASTS

Doctors at Work, the dramatized radio program broadcast by the American Medical Association and the National Broadcasting Company, will go on the air for its second season beginning December 6 from 5:30 to 6 p. m. eastern standard time (4:30 to 5 p. m. central standard time, 3:30 to 4 p. m. mountain standard time, 2:30 to 3:30 p. m. Pacific standard time). The program will be broadcast on upward of seventy-five stations affiliated with the Red Network of the National Broadcasting Company and will be heard from coast to coast. Doctors at Work, a successful serialized story broadcast last year, dealt with the experiences of a fictitious but typical American boy choosing medicine for his vocation and proceeding to acquire the necessary education and hospital training for the private practice of medicine. Interwoven with the personal story of young Dr. Tom Riggs and his fiancée, Alice Adams, was the romance of modern medicine and how it benefits the doctor's patients. The new series of broadcasts will

resume where last year's story left off, namely with the marriage of Tom Riggs and Alice Adams, and depict the subsequent life of a young doctor and his wife in time of national emergency in a typical medium sized American city. The program will be produced under the supervision of the Bureau of Health Education of the American Medical Association. Scripts will be by William J. Murphy of the National Broadcasting Company, author of such successful radio productions as *Flying Time*, *Cameos of New Orleans*, *Your Health*, *Medicine in the News* and last year's *Doctors at Work*. The scripts will again be produced by J. Clinton Stanley, and the National Broadcasting Company orchestra will be under the direction of Joseph Gallicchio as heretofore. Actors will be drawn from the well known group of Chicago radio actors previously heard in American Medical Association and other successful broadcasts. The program will be available at all stations affiliated with the Red Network of the National Broadcasting Company. Announcements should be sought in local newspaper radio columns under the title *Doctors at Work* or possibly American Medical Association or, in some instances, *Health Broadcasts*. Evidence of local interest in the program may be the determining factor in whether a local station takes this educational sustaining feature or sells its time to a local revenue producing program.

ANNUAL CONFERENCE OF SECRETARIES OF CONSTITUENT STATE MEDICAL ASSOCIATIONS

On November 14 and 15 the Annual Conference of Secretaries of Constituent State Medical Associations was held in the headquarters office of the American Medical Association. The keynotes of the current conference were military medical preparedness and extension of plans for the provision of medical service. The program included the following contributions:

The United States Army and Medical Preparedness. L. B. McAfee, Assistant Surgeon General of the United States Army.

The Federal Security Agency and Medical Preparedness. Watson Miller, Assistant Administrator of the Federal Security Agency.

Social Security Medical Problems in Illinois. Charles H. Phifer, President of the Illinois State Medical Society.

Principles Involved in Medical Service and Group Hospitalization Plans. Stanley B. Weld, Editor in Chief of the *Connecticut State Medical Journal*; Peter Irving, Secretary of the Medical Society of the State of New York.

Industrial Health: Progress and Prospects. C. M. Peterson, Secretary of the Council on Industrial Health of the American Medical Association.

How Can the State Medical Journals Best Serve Organized Medicine? Wingate M. Johnson, Editor of the *North Carolina Medical Journal*.

The Responsibilities of the Editorial Staff of a State Medical Journal. Robert N. Nye, Editor of the *New England Journal of Medicine*.

Address. Irvin Abell, Chairman of the Committee on Medical Preparedness of the American Medical Association and Chairman of the Health and Medical Committee of the Federal Security Agency.

The Role of the Medical Profession in the Selective Service System. Lewis B. Hershey, Director of the Selective Service System.

Medical Aspects of Civilian Defense. George Baehr, Chief Medical Officer of the Office of Civilian Defense.

So important were the addresses delivered on this occasion that it is proposed to publish some of them in full in future issues of *THE JOURNAL* and to publish as well a condensed report of such manuscripts and discussions as are not published in the complete report. The statement by Brigadier General Hershey on the present status and forthcoming plans of Selective Service, particularly with relation to the medical aspects of this work, was so important that his paper will be published in full in *THE JOURNAL* for November 29 under the heading of Medical Preparedness.

PROBLEMS CONFRONTING MEDICAL INVESTIGATORS

In a recent address at the fiftieth anniversary celebration of Stanford University, Dr. Walter B. Cannon¹ presented some questions which deserve careful study. The shift in age grouping of the population, with increasing percentages of the elderly and the aged, now widely recognized as a fact, has presented the medical profession with a series of new problems. As one grows older, Cannon points out, the fires of life burn less vigorously and the adjustments of bodily organs to emergencies tend to be impaired—the breath is shorter, the heart beats less effectively, blood pressure gradually rises as the years pass and becomes ill adapted to critical requirements. Are these features essential attributes of the elderly or are they the consequences of comfortable and habitual indolence? In middle age some of these effects may result from inactivity alone and can be reversed by training; is this true in the later decades? If so, should attempts be made to alter them? What, Cannon says, would be the effects if they were altered? These questions offer possibilities for useful research. Almost none of the most prominent disorders of senescence are thoroughly understood. The prevailing ignorance, it may be assumed, is largely due to lack of systematic study. The challenge presented by realization of this fact will doubtless receive many answers. Severe demands on the nervous system, which may have arisen in part from the remarkable shift in the occupation of the citizens, often result in calls for medical attention. A disorder of the brain may fail to be revealed at necropsy or under the microscope. And yet emotional upsets which leave in the nervous pathways no visible trace have concrete and obvious effects and may be the occasion for profound misery and suffering. The gradual onset of disabilities, bodily and mental, in the later years of life demands, Cannon believes, long range studies on the possible influence of inheritance, early injuries, severe infections in childhood and youth, frustrated plans, the demands of labor and probably many other conditioning experiences. Cannon also calls attention to the disastrous cooperation of disease, pain and early death when warring hosts or nations battle against nations for supremacy. International developments unquestionably have affected medical research in a warping of scientific activities away from untrammelled

pursuits toward problems of military significance. Medical investigators, however, by learning the nature and cure of malnutrition, by devising appropriate treatment for shock and hemorrhage and in many other ways have served to mitigate the torments and ravages of warfare. One of the results of the present war already has been a more intimate association of a highly desirable nature with medical investigators in Latin American nations. Finally Cannon emphasizes as one of the biggest problems facing medical investigators the filling of their own ranks. This is indeed primary, and, unless well equipped recruits can be attracted to the career of the investigator, progress will end. Cannon dwells at some length on the attractions and rewards of medical investigators, pointing out particularly one consideration eminently creditable to their efforts: "Because life and health are precious and medical research is deeply concerned with protecting life and health, the triumphs of that research are put to use without regard to any national or racial difference. . . . Even though the beneficiaries may despise their benefactors, they must receive the benefactions. . . . The conquest of a disease, it should be remembered, is a permanent conquest."

NEW AND NONOFFICIAL REMEDIES DESIGNATED IN NEW HAMPSHIRE LAW

An act relating to the sale of drugs in New Hampshire was approved on June 13 and took effect on October 1. This law, which is intended to curb further the promiscuous or unlicensed sale of potent drugs, designates, as standard compendiums for use in determining the drugs affected, the United States Pharmacopeia, the National Formulary and New and Nonofficial Remedies. The latter volume lists and describes the articles that stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on January 1 of the year of publication. The descriptions of accepted articles are based in part on investigations made by, or under, the direction of the Council and in part on evidence or information supplied by the manufacturer or his agents. Statements made by those commercially interested are examined critically and admitted only when they are supported by other evidence or when they conform to known facts. New and Nonofficial Remedies, which is only one of the books published under the authorization of the Council on Pharmacy and Chemistry, is intended chiefly for the physician, but it has proved of value to others who are concerned with medicinal preparations including manufacturers of pharmaceutical products, pharmacologists, governmental institutions, teachers and students. Designation of this volume in the New Hampshire Law is one more well deserved recognition of the Council's thirty-six years of continuous efforts to expose deceptions practiced on the medical profession and to evaluate proprietary drugs detailed to the profession. These efforts have contributed greatly to rational therapeutics.

1. Cannon, W. B.: Problems Confronting Medical Investigators, *Science* 94: 171-179 (Aug. 22) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

EQUIPMENT AND OPERATION OF EMERGENCY MEDICAL FIELD UNITS

MEDICAL DIVISION—BULLETIN NO. 2

Prepared by Office of Civilian Defense, Washington, D. C.
(See THE JOURNAL, Aug. 30, 1941, p. 793)

This bulletin supplements Medical Division Bulletin No. 1, which deals with the organization of Emergency Medical Service for Civilian Defense. The Office of Civilian Defense recommends that state and local defense councils adopt the plans set forth in these bulletins so as to secure the advantages of uniformity in organization, equipment and operation of Emergency Medical Field Units. In the event of a civilian disaster, adjacent communities which have adopted this common pattern can pool or exchange their resources. The adoption of uniform equipment standards during the national emergency is desirable also because of priorities in materials and manufacture. The recommended equipment conforms as far as possible, therefore, with that of the Medical Department of the U. S. Army.

The Field Casualty Service

As recommended in Bulletin No. 1 of the Medical Division, emergency medical field units should be established in all approved general hospitals, both voluntary and governmental, located in coastal states and in industrial centers of the interior. The plan of organization and size of the emergency field units for hospitals of various sizes and the total number of field units recommended on a population basis are outlined in Bulletin No. 1.

The emergency medical field units of a hospital are composed of two or more squads, so that at least one squad is on first call during each twelve hour period of the day. In larger hospitals reserve squads should be available at the call of the control center in the event that multiple sites of disaster should require the manning of additional casualty stations and first aid posts. All members of emergency medical field units should be systematically drilled in first aid procedures.

To be prepared to respond promptly and effectively, emergency medical units should also participate in field drills. These drills should be called by the local defense authority and should include police and fire auxiliaries, rescue squads, stretcher teams, transport and canteen services so that the local protection services may be integrated.

It is the considered opinion of the Medical Advisory Board of the Office of Civilian Defense that the medical field units should be related to hospitals. During the present period of preparation, prompt availability in the event of sudden and unexpected disaster can be expected only of units organized largely from the intern and resident staffs. It is advisable to designate an assistant surgical resident or surgical intern as squad leader. In order not to deplete the surgical staff of the hospital other members of emergency squads may be derived from the medical, pediatric and other nonsurgical divisions of the hospital.

Reserve Squads.—In the event of the more remote possibility of prolonged and continuous need for service in casualty stations and first aid posts, it would become necessary to replace most of the hospital personnel assigned to the field casualty service. Reserve squads made up of medical, nursing and trained volunteer personnel from the community would carry the major responsibilities for the field service. Until the need is demonstrated, it will be simpler and more efficient to concentrate the primary organization of emergency medical field units for the most part within approved hospitals.

In hospitals whose resident staff should not be depleted even for a temporary emergency, the primary medical field unit may

be organized in part or even wholly from physicians and nurses engaged in private practice in the community.

Operation of Field Casualty Service.—The operation of the field casualty service may be sketched as follows: Air raid warnings will come to the local control center from the military establishment in the area and will be relayed to the proper civilian defense officers. Information concerning the location and extent of local damage will be transmitted promptly to the control center by air raid wardens and other observers. Using a spot map showing the location of hospitals and sites for casualty stations, the control center or its substation will call out an appropriate number of emergency medical field units.

The squads of the emergency medical units which have responded will proceed to the sites to which they have been directed by the control center or its substation and set up casualty stations. When indicated, the squad leader in charge of a casualty station may dispatch one or more teams of physician, nurse and nursing auxiliaries to establish first aid posts at sites closer to the disaster. The establishment of fixed first aid posts and casualty stations is not at present contemplated.

CASUALTY STATIONS

The casualty station will occupy a predetermined site such as the clinic of a hospital, health department or voluntary agency, a health center or substation, a school basement or other suitable place which provides shelter, protection and accessibility. It should be located if possible on a side street so that ambulances will not block main thoroughfares. The sites selected for casualty stations should be numbered and indicated on a spot map of the community. The casualty station will:

1. Serve as a center from which medical teams may be sent closer to the disaster if required.

2. Care for the less severely injured and for persons suffering from shock and hysteria until they may be permitted to return to their homes or to temporary shelters. This will protect hospitals from the burden of minor casualties which would interfere with the work of caring for the seriously injured.

3. Keep a record of all persons treated at the station and see that all casualties transferred to a hospital are tagged.

The casualty station is to be supplied with stretchers, collapsible cots and blankets from medical depots located at sites from which the transportation of emergency medical service is derived. Eight stretchers, twenty-four cots and sixty-four blankets should be available per 10,000 of population for issue to casualty stations as the need arises. Where kitchen tables are not available at the location of a casualty station, two pairs of saw horses, each 36 inches high, may be required, on which stretchers may be placed to serve as dressing tables. Stretcher teams and rescue squads will obtain their stretchers at casualty stations.

FIRST AID POSTS

The first aid post will occupy a temporary location usually close to the scene of disaster and will:

1. Care for the more severely injured, preparatory to their transfer to a hospital. No surgery other than emergency first aid is contemplated.

2. Classify the casualties so as to expedite the transfer of the seriously injured to a hospital—a most important responsibility which requires surgical judgment.

3. Direct the stream of ambulatory and of slightly injured stretcher patients and those suffering from shock or hysteria to a casualty station.

4. Tag all casualties immediately. Maintain entries in the casualty record book of all persons receiving first aid. (A nurse or nurse's aide is to be responsible for these records.)

LIST 1.—Equipment for a First Aid Post
(Working supply for one physician's team)

Item	No.
Cases, carrying, waterproof (15 by 20 by 8 inches).....	2
Scissors, surgical, Mayo 5½ inch curved.....	1
Scissors, surgical, Mayo 5½ inch straight.....	1
Scissors, bandage, angular, 7½ inch.....	2
Forceps, hemostatic, Rochester, curved, 6½ inch.....	6
Forceps, hemostatic, Rochester, straight, 5½ inch.....	6
Forceps, tissue, spring, 5½ inch.....	1
Forceps, tissue, spring, mouse-tooth, 5½ inch.....	1
Forceps, tongue holding, 7 inch.....	1
Tube, breathing (airway) hard rubber or metal (adult).....	1
Tube, breathing (airway) hard rubber or metal (child).....	1
Retractor, tissue, double end nested 9 and 10 inch Army type, pair.....	1
Syringe, hypodermic, Luer, 2 cc.....	2
Needles, hypodermic, 25 gage, ¾ inch.....	12
Needles, hypodermic, 19 gage, 1¼ inch.....	6
Tubes, constriction (length 3 inches).....	12
Stoppers for constriction tubes.....	12
Handles, Bard Parker, No. 3.....	2
Blades, Bard Parker, No. 10, package of 6.....	1

DRUGS

Morphine sulfate syrettes, 0.015 Gm.....	20
Morphine sulfate syrettes, 0.030 Gm.....	10
Sulfathiazole, powder, vials, 5 Gm.....	12
Ointment, ophthalmic, boric acid, 5% (tube, 4 Gm.).....	1
Jelly, tannic acid, tube, 45 Gm.....	2
Soap, hand, bar.....	2
Alcohol, denatured, ethyl, bottle, 500 cc.....	1
Ammonia, aromatic spirit, bottle, 60 cc.....	1
Sodium bicarbonate.....	¼ lb.
Phenobarbital tablet, 0.03 Gm.....	100
Caffeine sodium benzoate, ampules, 0.5 Gm.....	12
Epinephrine hydrochloride, 1:1,000.....	20 cc.

DRESSINGS, BANDAGES AND SO ON

Compress, gauze, 4 by 4 inches.....	100
Compress, gauze, 2 by 2 inches.....	200
Pad, surgical, 8 by 10 inches (Dakin).....	25
Bandage, gauze, 2 inch.....	24
Bandage, muslin, 4 inch.....	24
Bandage, triangular, muslin, 50 by 36 by 36 inches.....	24
Cotton, absorbent, roll, sterile.....	2 oz.
Cotton batting, roll.....	1 lb.
Plaster, adhesive, 2 inch, 10 yards, roll.....	2
Pins, safety, large.....	48
Splints, basswood.....	12
Depressors, tongue, wood.....	24
Applicators, wood.....	25
Sheeting, rubber (45.....	1
Basins, white enamel.....	2
Stove, gasoline (Coleman).....	1
Pencil, indelible.....	1
Pencil.....	1
Pads.....	4
Pads.....	4
Gloves, surgical, rubber, size 8 (latex).....	2
Flashlight (two cell).....	1
Lantern, electric, dry cell type.....	1
Battery, dry cell, for lantern, No. 6.....	4
Battery, dry cell, for flashlight, No. 950.....	4
Cups, paper.....	25
Brush, nail.....	1
Towels, hand.....	12
Matches, safety, box.....	3
Tourniquet, field, web.....	3
Bag, laundry, small.....	1
Tags, identification, book of 20.....	6
Casualty Record Book.....	1

SUTURE MATERIAL

Catgut, plain No. 1, tubes, boilable.....	6
Silk, dermal, medium, 40 inch strand, package.....	6
Needles, suture, catgut, size 1, ½ circle, trocar point, Mayo.....	6
Needles, cutting edge, straight.....	6

Equipment for Emergency Medical Field Units

The following lists include only the minimum medical and surgical equipment required for emergency treatment at the site of a disaster. Provision for other than essential minor surgery has purposely been omitted.

The equipment for each physician and his team is to be carried in two portable boxes provided with handles. These two boxes should be of the same size (15 by 20 by 8 inches) and may be packed conveniently in the ambulance or other vehicle transporting the emergency squad to the site of the casualty station. The provision in separate containers of working supplies for

each physician will permit the squad of a casualty station to split off one or more teams of physicians and assistants who can be dispatched with their equipment to set up advanced first aid posts.

EQUIPMENT FOR A FIRST AID POST

List 1 indicates the medical and surgical equipment for each physician of an emergency medical field unit and his team of nurse and orderly or nurses' aide. One or more such teams man a first aid post. First aid posts are subsidiary to a casualty station which will furnish replacements of drugs and surgical supplies.

EQUIPMENT FOR A CASUALTY STATION

List 2 indicates the equipment for a casualty station. It contains bulky articles, such as traction splints, which could not be included in the equipment of the first aid post without impairing its mobility. These articles will be issued from the casualty station to the first aid posts as the need arises. Casualty stations are also stocked with dressings, bandages and drugs from which the supplies of the first aid posts may be replenished. Blood, plasma and biologic products such as tetanus antitoxin or toxoid may be obtained by casualty stations from the parent hospital as needed. They are, therefore, omitted from this list.

LIST 2.—Equipment for a Casualty Station
(Emergency squad of two or four physicians, nurses
and nursing auxiliaries)

Item	No.
Trunk, Army type (30 by 16½ by 12 inches).....	1
Pins, safety, large.....	100
Splint, basswood.....	30
Depressors, tongue, wood.....	100
Applicators, wood.....	50
Sheeting, rubber (45 by 72 inches).....	2
Basins, white enamel, 9 by 6 by 1½ inches (2 with cover).....	4
Gag, mouth.....	1
Stove.....	2
Catheter.....	4
Tags, identification.....	6
Pencil, indelible.....	4
Pencil.....	4
Pads.....	8
Refills.....	8
Gloves.....	4
Cups, paper.....	50
Brush, nail.....	2
Matches, safety, package of 12 boxes.....	1
Towels, hand.....	24
Lantern, electric, dry cell.....	2
Batteries, dry cell, lantern, No. 6.....	12
Tourniquet, field web.....	6
Bag, laundry, small.....	24
Splint, arm, hinge, Thomas.....	4
Splint, leg, half-ring, Army type.....	4
Splint, Thomas, leg, child.....	2
Splint, arm, Murray Jones, child.....	2
Catgut, plain No. 1, tubes, boilable.....	12
Silk, dermal, medium 40 inch strand, package of 12.....	1
Needles, suture, size No. 1, ½ circle, trocar point, Mayo.....	12
Needles, cutting edge, straight.....	12
Razor, safety.....	1
Blades, safety razor.....	12

DRUGS

Morphine sulfate syrettes, 0.015 Gm.....	40
Morphine sulfate syrettes, 0.030 Gm.....	20
Sulfathiazole, powder, vials, 5 Gm.....	24
Ointment, boric acid, ophthalmic, 5% tube, 4 Gm.....	2
Jelly, tannic acid, tube, 45 Gm.....	4
Alcohol, denatured, ethyl, 70%.....	1 qt.
Ammonia aromatic spirit, bottle, 60 cc.....	1
Caffeine sodium benzoate, 0.5 Gm, ampules.....	24
Phenobarbital, 0.03 Gm.....	200
Procaine hydrochloride tablets, 0.18 Gm.....	100
Soap, hand, bar.....	4
Sodium bicarbonate.....	¼ lb.
Sodium chloride compressed tablets, 1 Gm.....	100

DRESSINGS, BANDAGES AND SO ON

Compress, gauze, 4 by 4 inches.....	200
Compress, gauze, 2 by 2 inches.....	400
Pad, surgical, 8 by 10 inches (Dakin).....	50
Bandage, muslin, 4 inch.....	48
Bandage, gauze, 2 inch.....	48
Bandage, triangular, muslin (50 by 36 by 36 inches).....	48
Cotton, absorbent, roll.....	1 lb.
Cotton batting, roll.....	2 lb.
Plaster, adhesive, 2 inch, 10 yards.....	4

Identification Tags

The identification tag (fig. 1) is to be filled out by the first member of a rescue squad, stretcher team or first aid post to reach the casualty. This must be done immediately, because

the patient may lose consciousness. All the required information should be recorded. Information concerning the name and address of the injured and of the "person to be notified" are important to those anxious to locate the injured person. The place where an unconscious patient was found should be noted, as this may be the only clue to his identity.

It is important to record administration of narcotics or application of a tourniquet. Further treatment given at the first aid post or casualty station should be indicated on the back of the identification tag. Warnings concerning possible internal injury, hemorrhage or skull fracture should also be noted on the back of the tag to facilitate sorting of patients on arrival at the hospital.

The tag should be affixed securely to the patient and not to clothing which might later be removed.

IDENTIFICATION TAG	
Name	(Surname) (Given name)
Address	
Age	
Male <input type="checkbox"/>	Catholic <input type="checkbox"/> Single <input type="checkbox"/> White <input type="checkbox"/>
Female <input type="checkbox"/>	Protestant <input type="checkbox"/> Married <input type="checkbox"/> Negro <input type="checkbox"/>
	Jewish <input type="checkbox"/> Widowed <input type="checkbox"/> Other <input type="checkbox"/>
Person to be notified:	
Name	
Address	
Phone	Relation
Where tagged	
Date	194... Hour ... M.
Diagnosis:	
Treatment given:	
Morphine	Tourniquet
Where sent	
Signed	
Organization 16-23451 GPO	

Fig. 1.—Identification tag. This measures $3\frac{3}{4}$ by 6 inches, and the back is used for supplementary information.

A set of symbols to indicate the necessity for priority treatment has been devised to facilitate sorting of patients at the hospital. These symbols should be drawn prominently on the forehead of the patient at the first aid post or casualty station with a red skin pencil:

- U Urgent—requiring priority attention.
- TK Tourniquet.
- T Indicating tetanus antitoxin has been given.
- H Internal hemorrhage.
- M $\frac{1}{4}$ Indicating $\frac{1}{4}$ grain of morphine or
- M $\frac{1}{2}$ $\frac{1}{2}$ grain given.

In addition, a casualty record book will be part of the equipment of each physician's team (fig. 2). A nurse or nurses' aide should be assigned the responsibility for entering a record of every patient seen. This record should include the diagnosis, treatment and disposition.

Emergency Medical Service

It is important that each local defense council in the states along both seaboard and in industrial centers in the interior appoint without delay a chief of Emergency Medical Service

who shall be responsible to the local director of civilian defense for the organization of the Emergency Medical Service described in Medical Division Bulletin No. 1. He should be an outstanding medical leader and it is advisable that he be selected in consultation with the state defense council, the local medical society and the local health officer. To facilitate the integration of all local medical resources into a comprehensive program for civilian protection, it is recommended that the local chief of Emergency Medical Service be assisted by a medical advisory council consisting of the local health officer, an experienced hospital executive and representatives of the local medical society, the nursing profession, the American Red Cross and participating voluntary agencies.

DUTIES OF THE LOCAL CHIEF OF EMERGENCY MEDICAL SERVICE

Under the administrative authority of the local director of civilian defense, the duties of the local chief of emergency medical service are:

1. To determine the scope of the activities of all official and voluntary organizations which are to participate in the emergency medical program of civilian defense, to integrate these organizations into the comprehensive local program and to assist them in expanding their activities to the limit of their resources in personnel and equipment.
2. To assist hospitals in the locality to organize, equip and train emergency medical field units as outlined in Medical Division Bulletin No. 1, "Emergency Medical Service for Civilian Defense."
3. To inspect and select sites for the establishment of casualty stations.
4. To make a spot map of the locality, indicating the locations of hospitals, appropriate sites for casualty stations, depots for storage of stretchers, blankets and collapsible cots and the locations of rescue squads. The map should indicate the number of emergency medical squads in each hospital. Copies of the map should be supplied to control centers, police and fire departments, the health department, the local Red Cross chapter, the state defense council, the regional director, the regional medical officer and to all cooperating hospitals.
5. To plan and establish adequate transportation service for casualties and medical personnel in consultation with local government departments, the American Red Cross and voluntary agencies.¹
6. To arrange with the local control authority for field drills of emergency medical units and rescue squads in collaboration with police and fire auxiliaries, disaster relief and canteen services of the American Red Cross, the ambulance transport service and other civilian defense units and to supervise such drills.
7. To make an inventory of hospital beds in the locality and of the possibilities for emergency expansion in bed capacity.
8. To assist the authorities charged with preparing plans for evacuation in making an inventory of hospitals, convalescent homes, sanatoriums, hotels and other structures within a radius of 50 to 100 miles which might be used as base hospitals to which patients in city institutions could be evacuated.
9. To assist the local volunteer office in establishing courses for volunteers in the field of health, medical care, nursing and related activities.
10. To stimulate recruitment of volunteers for nurses' aide courses of the American Red Cross, assist the local Red Cross chapter in establishing training centers for volunteer nurses' aides at appropriate hospitals and assist the Red Cross placement bureau in placing nurses' aides with hospitals, clinics, health departments and field nursing services after completion of training.
11. To stimulate and guide extension of first aid training courses as widely as possible among the local population through the American Red Cross and other official and voluntary agencies.
12. To stimulate and guide industrial plants, business establishments and government bureaus in the locality in the training

1. A bulletin on transportation for the Emergency Medical Service is in preparation. It will include plans for stretcher teams, messenger service, ambulance and other transport needs of the Emergency Medical Service.

15. To keep the community and particularly the members of the health and medical professions and the participating official and voluntary organizations informed of the plans and activities of the local emergency medical service

Decontamination squad—A group of auxiliaries of the sanitation department trained and equipped to decontaminate localities and structures in order to rid them of persistent chemical agents

[illegible][illegible]

Ninth Civilian Defense Region—233 Sansome Street, San Francisco

BLOOD PLASMA NEEDED FOR THE ARMY AND NAVY

The Surgeon General of the Army, Major Gen. James C. Magee, has advised the American Red Cross that 1 pint of blood from each of one hundred thousand volunteer donors is required to meet the current emergency needs in the U. S. Army in this country and elsewhere. This need, General Magee said, is immediate and is not a project to collect and store blood for future use in case of war. If the country became involved in war, a far greater amount of blood plasma would be needed. It was also revealed that the U. S. Navy needs 100,000 units of blood plasma.

The Red Cross, therefore, is putting into effect plans for a great expansion in blood donor facilities. Whereas now blood donations are being made in seven cities, the Red Cross in the immediate future will have twenty-two local chapters engaged in this activity. Whereas only one laboratory is now engaged in processing the blood donated, the national director of the blood donor service, Dr. G. Canby Robinson, said that arrangements have been made with seven laboratories for the processing of the blood donated. These laboratories are doing this work on a nonprofit basis, and the Army and Navy pay only for the actual processing, as the blood is collected and shipped to the laboratories by the Red Cross. Some of this dried blood plasma has already been shipped for use in the present maneuvers in North and South Carolina, and other units have been shipped to our foreign outposts and to the Navy. Recently in the torpedoing of the U. S. S. *Kearny* the important role of blood plasma was illustrated in the saving of the life of a sailor who now is recuperating in a hospital in Iceland. In this case the blood plasma was dropped by parachute from a plane into the sea, then recovered from the sea and resterilized and administered to the sailor aboard the torpedoed vessel. The sailor, whose life had been considered in grave danger, showed steady improvement after several transfusions with the blood plasma.

THE NURSING REPRESENTATIVE IN THE LOCAL MEDICAL ADVISORY COUNCIL

Medical Division Bulletin No. 1, "Emergency Medical Service for Civilian Defense," of the Office of Civilian Defense, recommends the appointment of a nurse on the local medical advisory council in order to promote effective cooperation between the chief of emergency medical services, the local Red Cross chapter, the hospitals and the health and nursing agencies in the area. This council is to assist the chief of emergency medical services in integrating all local health and medical resources into the civilian defense program.

In selecting the nursing member, the Medical Division of the Office of Civilian Defense recommends that the following qualifications be observed:

1. She should be a graduate registered nurse.
2. She should be active in the nursing profession and be recognized by the local nurses as a leader.
3. She should be available to attend meetings.

If the nursing representative on each local medical advisory council is selected on this basis, she will secure the cooperation of the entire nursing profession in the training and subsequent use of volunteer nurses' aides.

CIVILIAN DEFENSE WEEK

During Civilian Defense Week, Friday, November 14, was designated "Health and Welfare Day" in order to emphasize the importance of a healthy population as the foundation for strong military defense, to minimize the economic and social disturbances caused by the impact of the defense program and to promote the cause of physical well-being.

On Health and Welfare Day, emphasis was placed on the fact that protection of civilians includes protection of their physical well-being by proper exercises, nutrition and medical care, protection of their social welfare by adequate economic security and by adequate educational, recreational and housing facilities.

Every state defense council already has a nutrition committee whose function it is to see that local defense councils in every community pay close attention to the matter of proper food.

The Office of Civilian Defense has initiated a national program to promote physical fitness under the general direction of John B. Kelly, assistant director, a famous Olympic athlete. This program, in which national figures in the field of sports have been recruited, is projecting a national program which, it is expected, will affect the physical training of every man, woman and child in the nation.

The Medical Division of the Office of Civilian Defense has initiated a program of Emergency Medical Service designed to affect communities of every size, to meet conditions occasioned by actual attack. These plans include base hospitals, evacuation and clearance hospitals, casualty stations, first aid posts, decontamination stations, transportation services, emergency public health nursing, emergency water and food protection, canteen facilities and every service that would be essential under emergency conditions.

BUNDLES FOR BRITAIN

Bundles for Britain, Inc., 745 Fifth Avenue, New York City, cabled funds totaling \$20,760, about November 1, to the London headquarters to assist twenty nongovernment hospitals in England and the British Red Cross and people of the Orkney and Shetland Islands. The largest gift in this sum was \$3,000 from Charlotte, N. C., for the Royal National Orthopedic Hospital in London. Many other branches of this organization were represented in the funds cabled, some of which earmarked their contributions for certain designated hospitals or for the purchase of some particular type of medical equipment. Some of the branches contributing to this fund were from far away, as Hawaii and Alaska.

PADEREWSKI HOSPITAL NEEDS EQUIPMENT

An appeal has been made by the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, for funds to purchase equipment for the Paderewski Hospital in Edinburgh, Scotland. Ten thousand dollars is wanted for the purchase of five operating sets, one portable x-ray unit, five thousand three hundred assorted instruments, nineteen physicians' first aid kits, two hundred gross of x-ray films and various biologic preparations. In response to a previous appeal from this hospital, supplies valued at more than \$7,000 were ready for shipment abroad the week of October 20.

DEFENSE ASPECTS OF PUBLIC HEALTH

Meetings were held at Herman Kiefer Hospital, Detroit, November 5, 12 and 26, for physicians in the Detroit area to study defense aspects of public health. The first meeting was addressed by Dr. Thomas Francis of the University of Michigan on "Influenza Control as a Problem in National Defense." These meetings are sponsored by the Wayne University College of Medicine, the Wayne County Medical Society and the Detroit Department of Health and other professional groups.

NAVY CONSULTANT APPOINTED

The Surgeon General of the Navy announced the appointment of Dr. Wilbur A. Sawyer, the director of the International Health Division of the Rockefeller Foundation, as an honorary consultant to the Medical Department of the U. S. Navy.

NAVY MEDICAL MEETING

At a meeting of the medical and dental officers of the U. S. Navy at the Naval Medical School, Washington, D. C., November 3, Lieut. Comdr. LeRoy D. Fothergill, M. C., discussed "The Problem of Diphtheria in the Armed Services."

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ALTERBAUM, George, 1st Lieut, Brooklyn, Camp Davis N C
AYARS, Lawrence S, 1st Lieut, Roslyn Heights, N Y, Camp Blinding, Fla
BAKER, Augustus L, Jr, 1st Lieut, Dover, N J Fort Jay, N Y
BEIN, Solomon S, Captain, Brooklyn, Mitchell Field, N Y
COHN, Mortimer M, 1st Lieut, Brooklyn, Camp Folk, La
CRILLY, James A, 1st Lieut, Elizabeth, N J, Fort Jackson, S C
D'AGATI, Vincent C, 1st Lieut, Jackson Heights, N Y, Fort McClellan, Ala
DORMONT, Richard Edward, 1st Lieut, Brooklyn, Fort Bragg N C
DUBINS, Henry B, 1st Lieut, Brooklyn, Fort Jackson, S C
FISHER, Hyman, Major, Laurelton, L I, N Y, Camp Wheeler Ga
GARSON, Byron Jerome, 1st Lieut, New York, Fort McPherson, Ga
HELDMAN, Arthur, 1st Lieut, New York, Camp Shelby, Miss
HERZFELD, Melvin G, Lieut Colonel, New York, Camp Gordon, Augusta Ga
JELSONINO, Samuel J, 1st Lieut, Buffalo, Fort Niagara, N Y

FIFTH CORPS AREA

The following additional medical reserve corps officers have been ordered to duty by the Commanding General, Fifth Corps Area, which comprises the states of Ohio, West Virginia, Indiana and Kentucky:

BIZOT, William H, 1st Lieut, Louisville, Ky, Erie Proving Ground, Lacarne, Ohio
DAVIS, Daniel, 1st Lieut, Toledo, Ohio, Camp Perry, Ohio
DORMANN, Jack, 1st Lieut, Indianapolis, Fort Knox, Ky
EARP, Evason B, Major, Indianapolis, Camp Perry, Ohio
HALL, Joseph E, 1st Lieut, New Cumberland, W Va, Fort Thomas, Ky
HANIFAN, Richard K, 1st Lieut, Clarksburg, W Va, Fort Knox, Ky
HUGHES, Carlisle B, Jr, 1st Lieut, Huntington, W Va, Fort Knox, Ky
JOHNSTON, Donald D, Lieut Col, Fort Wayne, Ind, Fort Hayes, Ohio
JONES, Paul A, 1st Lieut, Lyons, Ind, Fort Hayes, Ohio
KIRCH, Leo N, 1st Lieut, Indianapolis, Fort Benjamin Harrison, Ind
McCANN, Harold F, 1st Lieut, Clarksburg, W Va, Camp Shelby, Miss

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

ATKINS, Paul N, 1st Lieut, Muskogee, Okla, Station Hospital, Fort Sill, Okla
AULT, Charles A, 1st Lieut, Dallas, Texas, Station Hospital, Fort Sam Houston, Texas
BERSHOF, Edward, 1st Lieut, Denver, Station Hospital, Fort Sam Houston, Texas
CARRINGTON, William L, 1st Lieut, Mexico, Texas, Station Hospital, Fort Sam Houston, Texas
CHEATWOOD, William R, 1st Lieut, Ada, Okla, Station Hospital, Camp Wallace, Texas
CLARK, Richard Gwyn, Captain, Gainesville, Texas, Station Hospital, Fort Sill, Okla
COATES, Ruge Reginald, 1st Lieut, Oklahoma City, Station Hospital, Fort Sill, Okla
ELLISON, Grayfree, 1st Lieut, Norman, Okla, Station Hospital, Fort Sill, Okla
LINTER, Marcus H, 1st Lieut, Phoenix, Ariz, Station Hospital, Fort Bliss, Texas
GOTTLICH, Arthur Paul, 1st Lieut, Dallas, Texas, Station Hospital, Fort Sill, Okla

ALLEN, Lloyd R, Lieut Col, Colorado Springs, Colo
ARRINGTON, John H, 1st Lieut, Wichita Falls, Texas
BARRETT, John H, 1st Lieut, Palestine, Texas
CHRISTMAN, Edmund L, 1st Lieut, Joplin, Mo
CLARK, Ralph O, 1st Lieut, Oklahoma City
COLLINS, William A, 1st Lieut, El Paso, Texas
DAY, Meriwether L, 1st Lieut, Phoenix, Ariz
FARNUM, Lorenzo M, Jr, 1st Lieut, Oklahoma City
FRISSELL, Ben P, Captain, Phoenix, Ariz
JOHNSON, Emmett R, 1st Lieut, Topeka, Kan

ADAMS, Blair S, 1st Lieut, Camp Huachuca, Texas
BOERSMA, Donald, 1st Lieut, Fort Bliss, Texas
LLINAS, Marvin, 1st Lieut, Fort Sill, Okla

JONES, John A, 1st Lieut, New York, Fort Dix, N J
KREININ, Sidney, 1st Lieut, Brooklyn, Camp Shelby, Miss
LING, William Soy Ming, 1st Lieut, New York, Fort Knox, Ky
MANCUSI UNGARO, Ludwig E, 1st Lieut, Brooklyn, Fort Knox, Ky
McWHORTER, John E, 1st Lieut, Englewood N J, Fort Knox, Ky
MILLER, Clark F, 1st Lieut, New Brunswick, N J, Fort Dix, N J
MILLIGAN, Paul R, 1st Lieut, Orange, N J, Camp Gordon, Ga
MINERVA, Frank, 1st Lieut, Brooklyn, Fort Bragg, N C
PENNOYER, James, 1st Lieut, Montclair, N J, Camp Davis N C
ROSENBERG, Theodore, 1st Lieut, New York, Fort Bragg, N C
SAND, Abraham B, 1st Lieut, Burlington, N J, Fort Dix, N J
SCHWARTZ, Frederick, Captain, Brooklyn, Camp Upton, N Y
SHIRES, Edward B, 1st Lieut, Rochester, N Y, Fort Bragg, N C
SPIRITES, Morris A, 1st Lieut, New York, Fort Bragg, N C
STEIN, Benjamin M, 1st Lieut, Hempstead, L I, N Y, Camp Shelby, Miss
STIEGLER, Charles F, 1st Lieut, New York, Fort Bragg, N C
THREKELD, Lal D, 1st Lieut, Syracuse, N Y, Fort Bragg, N C
VANDERCAR, Edward J, 1st Lieut, Cohoes, N Y, Fort Bragg, N C
VINCI, Vincent J, 1st Lieut, New York, Fort Dix, N J

Orders Revoked

JACOBS, Ralph, 1st Lieut, Brooklyn, Fort McClellan, Ala

McEWEN, John C, 1st Lieut, Van Lear, Ky, Fort Thomas, Ky
MALLIN, Lloyd P, 1st Lieut, Cincinnati, Fort Knox, Ky
MURRAY, Hershell B, 1st Lieut, West Liberty, Ky, Fort Hayes, Ohio
NORMAN, William H, 1st Lieut, Indianapolis, Erie Proving Ground, Lacarne, Ohio
ROOT, Harold E, 1st Lieut, Bellevue, Ohio, Fort Knox, Ky
SALSBERY, Otto N, 1st Lieut, Norwood, Ohio, Fort Knox, Ky
SHALLENBERGER, David W, 1st Lieut, Cleveland, Camp Perry, Ohio
SITES, Charles J, 1st Lieut, Upper Tract, W Va, Camp Shelby, Miss
TODD, Gordon L, Jr, 1st Lieut, Princeton, W Va, Fort Benjamin Harrison, Ind
VAN NESS, William C, 1st Lieut, Summitville, Ind, Fort Knox, Ky
WALKER, James S, 1st Lieut, Indianapolis, Erie Proving Ground, Lacarne, Ohio
WARREN, Carrol B, 1st Lieut, Marshall, Ind, Fort Benjamin Harrison, Ind
WATSON, Thomas W, 1st Lieut, Wayne, Ohio, Camp Perry, Ohio
WILLIAMS, Fielding P, 1st Lieut, Huntingburg, Ind, Camp Grant, Ill
ZAPOLAN, Wolfe, 1st Lieut, Dayton, Ohio, Fort Hayes, Ohio

HARRIS, Hunter Pickney, 1st Lieut, Fulshear, Texas, Station Hospital, Fort Sam Houston, Texas
HOLLEY, Sion W, 1st Lieut, Farmingdale, N Y, Station Hospital, Fort Sam Houston, Texas
KOBORG, Frederick J, 1st Lieut, Big Spring, Texas, 35th Medical Battalion, Fort Sam Houston, Texas
KOST, Louis Branard, 1st Lieut, Galveston, Texas, Station Hospital, Fort Sam Houston, Texas
LESKIN, Louis Woron, 1st Lieut, Waco, Texas, Station Hospital, Fort Sam Houston, Texas
MINSON, William Charles, 1st Lieut, Kirbyville, Texas, Station Hospital, Fort Sill, Okla
MONTGOMERY, Robert E, Jr, 1st Lieut, Douglas, Ariz, Station Hospital, Fort Sill, Okla
PRATHER, Frank William, 1st Lieut, Sulphur, Okla, 38th Infantry, Fort Sam Houston, Texas
REYNOLDS, John Haynes, 1st Lieut, Muskogee, Okla, Station Hospital, Fort Sill, Okla
SHAVER, Benjamin Borrum, 1st Lieut, San Antonio, Texas, Station Hospital, Fort Sam Houston, Texas
SMITH, George Paul, 1st Lieut, Denver, 36th Evacuation Hosp, Fort Sam Houston, Texas
SOLIS, Rene Adolfo, 1st Lieut, Rio Grande City, Texas, Recruiting Station, Hubbock, Texas
WOOD, Joe Billy, 1st Lieut, Sulphur Springs, Texas, Station Hospital, Fort Sill, Okla

Orders Revoked

KERR, Walter C H, 1st Lieut, Picher, Okla
LO BELLO, Leon C, 1st Lieut, Dallas, Texas
MAYFIELD, Warren T, Captain, Norman, Okla
McGEHEE, Charles L, Captain, San Antonio, Texas
MOFFITT, Lauri W, 1st Lieut, Tucson, Ariz
MOLHOLM, Clifford E, 1st Lieut, Crownpoint, N M
OATES, I A Ried S, 1st Lieut, Center, Texas
PERRY, James H, 1st Lieut, Fredericksburg, Texas
ROBINSON, Cecil A, 1st Lieut, Kermit, Texas
WYSS, Herbert E, 1st Lieut, Keller, Texas

Relieved from Active Duty

LAWRENCE, Buell Avant, Captain, Fort Sill, Okla
MORGAN, Thomas Lomax, 1st Lieut, Fort Huachuca, Ariz

ORGANIZATION SECTION

MEDICAL ECONOMIC ABSTRACTS

MEDICAL CARE FOR SOCIAL SECURITY CLIENTS IN ILLINOIS

The Illinois Department of Public Welfare has issued instructions to county medical advisory committees concerning the methods of supplying medical care to persons receiving old age assistance or who fall under the aid to dependent children program. The federal government will match state funds for old age assistance only when monthly payments are made directly to the recipient. Payments for services cannot be made directly to professional practitioners. All old age assistance is limited to \$40 a month. If the total does not amount to \$40, an allowance to meet the cost of medical or dental care may be included in the monthly payment when the need for such care has been established. This is determined through discussion by the recipient with the county department of public welfare. The need for such care must be established through statements by physicians giving diagnosis and cost of medical care.

It is possible to include a small medical allowance without a physician's recommendation for the purpose of meeting the recipient's "medicine chest" needs. If it is not possible to include the cost of medical care within the \$40 monthly maximum, medical and surgical or hospital care may be authorized by the township supervisor. The federal Social Security board has recommended an amendment to the federal Social Security act by which funds may be turned over to the state specifically for medical care purposes without the requirement of cash payment to the recipient. If this amendment becomes a law and is followed by appropriate state enabling legislation, direct payments may be made to physicians and dentists for services given to old age pensioners and dependent children.

The Division of Public Assistance has asked the Illinois State Medical Association to cooperate in planning a medical care program, and the division has been meeting with a state advisory committee on medical care since January 1941. The Illinois State Medical Association was requested to appoint county medical advisory committees. These committees will cooperate with the county departments in medical matters. The Division of Public Assistance states that its "medical care program has been planned so that the traditional relationship between the patient and the physician may be continued and a free choice of physician recognized."

PHYSICIANS GO TO SMALL TOWNS

To test the truth of the allegation that recently graduated physicians refuse to practice in small towns, Dr. J. F. Hassig, secretary of the Kansas State Board of Medical Registration and Examination, made a survey of the sizes of the towns in which physicians have found locations during the past ten years.¹ The result of this study is given in the accompanying table.

According to the census of 1930 there were 411,202 persons living in the towns of 5,000 population or less, and the survey showed that 203 physicians started practice in these towns.

Locations of Physicians by Size of Towns

Year	Under 1,000	1,000 to 2,000	2,000 to 3,000	3,000 to 4,000	4,000 to 5,000	5,000 to 10,000	10,000 to 15,000	15,000 to 20,000	20,000 to 30,000	30,000 to 125,000
1930.....	8	5	6	4	1	3	5	1	4	6
1931.....	4	4	5	1	0	5	8	7	1	11
1932.....	7	7	1	3	2	7	7	1	2	13
1933.....	5	4	0	4	6	1	10	2	2	7
1934.....	8	5	6	2	0	2	8	0	2	17
1935.....	5	4	4	3	4	7	7	3	2	20
1936.....	10	7	1	3	4	7	7	1	2	21
1937.....	4	9	5	3	2	4	9	0	1	21
1938.....	8	8	4	1	3	3	13	2	1	19
1939.....	5	4	1	0	3	1	7	4	3	34
Total..	64	57	33	24	25	40	81	21	20	100

In the cities having more than 5,000 population there were 622,979 persons, and 332 physicians started practice in these during the decade. It is impossible to determine to what extent the approximately 850,000 persons living outside any incorporated place were served by the physicians in the different size cities, but the study would certainly seem to indicate that the smaller cities have not been avoided by physicians entering practice.

Kansas has no county not served by a doctor of medicine, no areas more than 30 or 35 miles from a hospital, and the overwhelming majority of its areas are 10 or 15 miles or less distance from a hospital. It has almost the national average of population per physician, and its age groups of physicians and its specialists are well distributed throughout the state.

1. Locations, editorial, J. Kansas M. Soc. 42: 299 (July) 1941.

WOMAN'S AUXILIARY

Pennsylvania

Dr. Chester K. Kistler, president of the Berks County Medical Society, recently presented awards to the winners of the Health Essay Contest conducted by the auxiliary in the high schools of Berks County. Eleven schools entered the contest and 168 essays were submitted. Six prizes were awarded.

The Philadelphia County auxiliary recently held its eleventh annual Health Institute. The speakers were Dr. Francis F. Borzell, president of the state medical society; Major James B. Mason, unit instructor of the Medical Reserve Corps; Capt. John B. Kaufman, district medical officer, Fourth Naval District, U. S. Navy; Dr. Malcolm W. Miller, allergist at the Lankenau Hospital, Philadelphia; Mrs. Maxwell Lick, president of the state auxiliary; Dr. Leon H. Collins Jr., chairman of the Pneumonia Control Committee of the Philadelphia County Medical Society; Dr. Edward A. Strecker, consultant at the Pennsylvania Hospital, Philadelphia, and Dr. Edward L. Bortz, president of the Philadelphia County Medical Society. A tribute was paid to Mrs. Wilmer Krusen, the founder of the

Health Institute. Mrs. Krusen was elected an honorary member of the auxiliary and presented with a bouquet of flowers. The theme of the institute was "Medicine and the National Crisis" and was prepared by Dr. Bortz.

Texas

The Henderson County auxiliary met, September 16, at the home of the president, Mrs. B. C. Wallace of Athens, who gave a report of the recent meeting of the state executive board at Dallas. Mrs. R. H. Hodge read an article entitled "Our Ailing Mental Hospitals."

The Smith County auxiliary at its last meeting in the spring voted to dispense with the usual auxiliary program, meeting instead on the regular meeting day as a unit with the local Red Cross chapter in the surgical dressings department. Auxiliary dues will be paid and affiliation maintained with the state and national auxiliaries. Business meetings will be held each month as in the past. Each member will serve from 9 a. m. until 12 noon in the rooms of the Red Cross chapter on the regular meeting date, which the Smith County auxiliary has voted as its part in the defense program.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1817.

CALIFORNIA

Meeting on Nutrition.—Helen S. Mitchell, Ph.D., director of nutrition for the Federal Security Agency, Washington, D. C., was the speaker at a conference of representatives of professional groups of Southern California, November 12, under the auspices of the state nutrition for defense committee and the nutrition committees of the Southern California counties. Dr. Mitchell was formerly research professor of nutrition at Massachusetts State College, Amherst, Mass.

FLORIDA

New County Health Unit.—Okaloosa and Walton counties have set up a full time health service. The two units will be operated independently with separate staffs but will be under the supervision of Dr. Charles W. McDonald, Marianna, who will divide his time between the two counties, newspapers reported.

District Meetings.—The Southeast Medical District Society held its fifth annual session in Hollywood, October 30. Among others, the following spoke: Drs. Eugene C. Chamberlain, Fort Lauderdale, "Digitalis Poisoning"; Lloyd J. Netto, West Palm Beach, "Unrecognized Importance of Minor Injuries," and Gilbert S. Osincup, Orlando, "Observations as a Result of Six Years of Early Feeding of Infants."—Speakers before the fifth annual session of the South Central Medical District Society in Orlando, November 1, included Drs. Thomas M. Rivers, Kissimmee, on "Relation of Vitamin B Complex to Human Pathology"; Don D. C. C. Robertson, Orlando, "Use of Eucupin Solutions in the Production of Prolonged Postoperative Analgesia in Rectal Surgery," and John Randolph Perdue, Miami, "Cesarean Section—A Ten Years Study."—The Southwest Medical District Society was addressed at its fifth annual session in Bartow, October 31, among others, by Drs. David R. Murphey Jr., Tampa, on "Use of the Miller-Abbott Tube in Cases of Intestinal Ileus"; Joseph J. Ruskin, Tampa, "Spinal Anesthesia," and Arthur H. Weiland, Coral Gables, "Rehabilitation of Child Following Anterior Poliomyelitis."

ILLINOIS

Personal.—Dr. Samuel W. McKelvey, Belleville, has been appointed consulting surgeon for state hospitals at Alton and Jacksonville, it is reported.—Dr. Clifford U. Collins was guest of honor at a banquet given by the Peoria Medical Society, October 8, in recognition of his completion of fifty years in the practice of medicine, all spent in Peoria. He was granted membership in the "Fifty Year Club" of the state medical society.—Dr. Victor M. Brian, Lawrenceville, has been elected chairman of the health division of the petroleum section of the National Safety Council, Chicago.—Dr. Herbert L. Pettitt, Morrison, has been named assistant health director of the state department of public health, with headquarters in Springfield.—Dr. William M. Miller, Cabery, has received a gold plaque from the Illinois Central Railroad, denoting his completion of fifty years' service.

Chicago

Personal.—Dr. Lloyd L. Arnold has been given a year's leave of absence as professor of bacteriology and public health, University of Illinois College of Medicine, to finish writing a textbook on preventive medicine and public health, it is reported.—Dr. Leo A. Kaplan has been appointed assistant director of the behavior clinic of the Criminal Court of Cook County.

Society News.—Dr. Horton C. Hinshaw, Rochester, Minn., will address the Chicago Tuberculosis Society at the Bismarck Hotel, November 27, on "Chemotherapy in Experimental Tuberculosis."—Dr. Gladys R. H. Dick addressed the American Medical Women's Association, Branch No. 2, November 12, on "Prevention and Therapy of Scarlet Fever."—Among others, John I. Nurnberger spoke before the Chicago Pathological Society, November 10, on "Method for Determining the Viscosity of Venous Blood."

INDIANA

A Veteran County Secretary.—The *Journal* of the Indiana State Medical Association for November comments on the many years of service of Dr. Wilson T. Lawson, Danville, as secretary of the Hendricks County Medical Society. Dr. Lawson has served continuously in this capacity since 1879 with the exception of three years when he was president of the society.

Board of Registration in Medicine.—Dr. Hugh W. Eikenberry, Peru, has been named a member of the state board of registration in medicine, succeeding Dr. James M. Hicks Jr., Huntington, and Clarence F. Aumann, D.C., Indianapolis, succeeding Harry K. McIlroy, D.C., Indianapolis. Members who were reappointed are Dr. Norris E. Harold, Indianapolis; Dr. Jesse W. Bowers, Fort Wayne; Dr. Hobart C. Ruddick, Evansville, and Clarence B. Blakeslee, D.O., Indianapolis.

LOUISIANA

Society News.—Dr. Charles J. Bloom, New Orleans, addressed the Tangipahoa Parish Medical Society, recently, in Hammond on "Recent Advances in Pediatrics."—The Orleans Parish Medical Society was addressed in New Orleans, October 13, by Drs. Howard R. Mahorner, New Orleans, on "Sympathetic Nerve Block in Rehabilitation of the Injured Extremity" (Case Report).

Award to Dr. Matas.—Dr. Rudolph Matas, since 1928 professor of general and clinical surgery, emeritus, Tulane University of Louisiana School of Medicine, New Orleans, was presented with the Times-Picayune Loving Cup for 1940, October 25, "in recognition of his years of unselfish service to his fellowman." Leonard K. Nicholson, president of the *Times-Picayune* and the *New Orleans States*, made the presentation and Dr. Maxwell E. Lapham, dean of the medical school and W. R. Irby professor of obstetrics, presided. A luncheon followed the ceremony, which was held in the auditorium of the Hutchinson Memorial Building as a part of the "home coming" program. Dr. Matas is the third physician to receive the award since it was established in 1901, the other two being Dr. Arthur W. De Roaldes in 1905 and Dr. Sara T. Mayo in 1910.

MAINE

Society News.—The New England Society of Psychiatry was addressed at its regular fall meeting in Augusta, October 17, by Major Donald E. Currier of the Massachusetts National Guard, Wenham, and chief of the medical division, Massachusetts Selective Service System, Boston, on "Medical and Psychiatric Features of the Selective Service Program."—Dr. Clarence Wesley Sewall, Boston, discussed "Eclampsia" before the Kennebec County Medical Association in Gardiner September 18.—Dr. Frederick T. Hill, Waterville, addressed the Piscataquis County Medical Association in Dover-Foxcroft, September 18, on postgraduate education.

MARYLAND

Personal.—Dr. William Ross Cameron, Baltimore, on September 13 was commissioned senior surgeon in the U. S. Public Health Service for duty as regional medical officer of the Third Civilian Defense Area. Dr. Cameron served for many years as public health administrator in Alabama and West Virginia and with the Maryland State Department of Public Health.—Dr. George W. Corner, director of the department of embryology of the Carnegie Institution of Washington at Baltimore, has been elected a foreign corresponding member of the National Academy of Medicine of Argentina.

Dr. McCollum to Deliver Harben Lectures in Canada.—Elmer V. McCollum, Sc.D., professor of biochemistry, Johns Hopkins University School of Hygiene and Public Health, Baltimore, will deliver the Harben Lectures of the Royal Institute of Public Health and Hygiene of London, England, for 1941. Because of war conditions, the University of Toronto has been designated for the delivery of the lectures December 1-3. Dr. McCollum will discuss "Nutritional Science and Public Health." The separate titles of the lectures are "Inorganic Elements Which Present Nutrition Problems of Practical Importance," "Problems Presented by the Availability of Low-Cost Synthetic Vitamins—Enrichment, Fortification and Restoration of Refined Foods" and "Nutrition Problems Presented by Low Income Families."

MINNESOTA

Society News.—The Minnesota Society of Neurology and Psychiatry was addressed in St. Paul, September 9, by Drs. Philip H. Heersema, Rochester, on "Symptomatic Treatment of Hysteria" and Alex Blumstein and Carl M. Eklund, Minneapolis, "Equine Encephalitis in the Human."—The Wabasha County Medical Society was addressed in Wabasha, October 9, by Drs. Donald G. Mahle, Plainview, who gave his presidential address on undulant fever; Edward N. Cook, Rochester, Minn., enuresis; Thomas G. Wellman, Lake City, "Ligation in Treatment of Varicose Veins," and Victor F. J. Bruder, Winona, "Carcinoma of the Cervix."—Dr. John R. Meade, St. Paul, discussed diabetes before the Washington County Medical Society, September 9, in Stillwater.

Annual Session of Medical Foundation.—An annual meeting of the Minnesota Medical Foundation was held in the University of Minnesota Union, Minneapolis, November 7, with Dr. Erling S. Platou, Minneapolis, president, presiding. According to a report of the treasurer, Dr. Jennings C. Litzenberg, Minneapolis, the organization now has available more than \$40,000 to be used in making grants for research, lectureships and in other ways promoting the interests of medical education in the University of Minnesota. Dr. Morris Fishbein, Editor of *THE JOURNAL*, spoke on "Medicine in the Emergency." The *Bulletin* of the Minnesota Medical Foundation appeared in November in a new form under the title "Trends in Medical Practice and Research," containing abstracts of recent contributions by members of the faculty and a number of original articles on various subjects.

MISSOURI

Biennial Registration of Physicians Due by December 31.—Every person licensed to practice medicine and surgery in Missouri must register biennially, in odd numbered years, on or before December 31 with the state board of health and at that time pay a fee of \$1. If such a person fails to register timely, the required fee plus 50 cents for each month or part thereof of delinquency must be paid to the board. In addition, a person who practices without registering timely may be subjected to a fine of not more than \$500 or imprisonment up to six months, or both, for each day of practice without such registering.

NEW MEXICO

Plague Infection.—*Public Health Reports* announces that plague infection was found in a pool of 147 fleas collected from 59 *Cynomys gunnisoni zuniensis* prairie dogs shot at locations southwest of Ramah, Valencia County, and in another pool of 188 fleas from 29 prairie dogs of the same species shot in a location east of Ramah on September 9.

NEW YORK

Professor of Hygiene and Public Health.—Dr. William T. Clark, associate professor of hygiene and public health at the University of Buffalo School of Medicine, Buffalo, has been appointed professor and head of the department of hygiene and public health to succeed the late Dr. Walter S. Goodale. The latter had held the position for sixteen years prior to his death, October 8, and just a few days before had been made professor emeritus, newspapers reported. Dr. Clark has also been appointed superintendent of the Edward J. Meyer Memorial Hospital, a city institution, where he has been a member of the staff. This position was also held by Dr. Goodale at the time of his death. Dr. Clark graduated at the University of Buffalo School of Medicine in 1925 and received his degree in public health from Johns Hopkins University, Baltimore, in 1937.

New York City

The Harvey Lecture.—Dr. Thomas Francis Jr., professor of epidemiology, School of Public Health, University of Michigan, Ann Arbor, will deliver the second Harvey Society Lecture of the current series at the New York Academy of Medicine, November 27, on "Factors Conditioning Resistance to Epidemic Influenza."

Appointed to Palestine Hospital Staff.—Dr. Henry Wigderson, an instructor in surgery (neurosurgery) at New York University College of Medicine and a member of the staffs of several hospitals, has been appointed head neurosurgeon in the Rothschild-Hadassah-University Hospital at the medical center on Mount Scopus, near Jerusalem. He graduated at the University of Maryland School of Medicine, Baltimore, in 1931. With his wife, he was to leave for Palestine on October 24.

Dinner Marks Expansion of Birth Control Movement.—A dinner was held at the Hotel Roosevelt, October 16, to observe the founding of the first birth control clinic by Mrs. Margaret Sanger, and simultaneously throughout the country twenty-six meetings convened to commemorate the event. The national observance was under the auspices of the Birth Control Federation of America, the National Committee for Planned Parenthood and other civic groups, the *New York Times* reported. As part of the national celebration it was announced that there are now six hundred and twenty-five clinics, of which one hundred and ninety-two are located in public health quarters, now in operation in the country.

Appointments at Columbia.—Appointments recently announced by Columbia University for 1941-1942 include the following:

Dr. Charles C. Wilson, Hartford, Conn., professor of health and physical education at Teachers College.

Drs. David Ulmar, assistant clinical professor of medicine, and Gerald H. Pratt, assistant clinical professor of surgery, in the New York Post-Graduate Medical School and Hospital.

Drs. Frederick A. Mettler, associate professor of anatomy, and Alson E. Braley, assistant professor of ophthalmology in the College of Physicians and Surgeons.

Drs. Myron E. Wegman, assistant professor of child hygiene, and Oscar G. Costa Mandry, assistant professor of tropical medicine in the School of Tropical Medicine of the University of Puerto Rico under the auspices of Columbia in San Juan, P. R.

OHIO

Postgraduate Lectures.—The Ohio State Medical Association resumed its five year program of postgraduate lectures on November 5, when it opened a series in McConnsville. Other series were started in Dennison on November 6, Ashland on November 7, Springfield on November 12 and Piketon on November 13. The subjects included treatment of burns, chemotherapy, treatment of nephritis, deficiency diseases seen as complications of common medical conditions and control of obstetric hazards.

OREGON

Annual Registration Due December 1.—All practitioners of medicine and surgery holding licenses to practice in Oregon are required by law to register annually on or before December 1, with the secretary of the board of medical examiners, and at that time to pay a fee of \$5. A practitioner failing to register is subject to a penalty of \$1 for each thirty days, or part thereof, of default, and his failure to reregister within ninety days after December 1 is a misdemeanor.

Society News.—Drs. Howard C. Naffziger and Harry Glenn Bell, San Francisco, addressed the Central Willamette Medical Society in Corvallis October 2. Dr. Naffziger spoke on "Disability in the Upper Extremities from the Scalene Syndrome," "Causes of Back Pain and Sciatica" and "Needs of National Defense." Dr. Bell discussed "Lesions of the Small Bowel" and "Use of Sulfanilamide and Related Compounds in the Treatment of Lesions of the Colon."—Drs. Leo S. Lucas, Harry C. Blair and Gilbert J. McKelvey, Portland, discussed "Disabilities and Fractures of the Knee Joint" and Dr. John E. Raaf, Portland, "Indian Medicine and the Medicine Man" at a meeting of the Multnomah County Medical Society, Portland, October 1.

PENNSYLVANIA

Personal.—Dr. Edgar S. Buyers, Norristown, who has retired after thirteen years' service as trustee and council of the Second Council District, was presented by the membership with a bronze plaque.

Infantile Paralysis in Collingdale.—Five public and parochial schools in Collingdale, Delaware County, were closed on October 29 when 1 case of infantile paralysis was discovered in the borough, newspapers reported. The case was the first in Collingdale this year. Another new case was discovered in Ardmore.

Society News.—Dr. Moacyr E. Alvaro, São Paulo, Brazil, addressed the Reading Society of Ophthalmology and Otolaryngology, October 30, on "Pan American Ophthalmology."

—A symposium on infantile paralysis was presented before the Westmoreland County Medical Society in Latrobe, November 4, by Drs. Edmund R. McCluskey and James O. Wallace, both of Pittsburgh.

Philadelphia

Meeting of Ex-Residents.—The fifty-fifth annual dinner of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital will be held on December 2 at the Midway Club, Fidelity-Philadelphia Building. Dr. James W. McConnell will be the guest of honor, and Dr. Russell S. Boles, president of the association, will preside and serve as toastmaster.

First Pancoast Memorial Lecture.—Dr. George W. Holmes, clinical professor of roentgenology, Harvard Medical School, Boston, delivered the first Pancoast Memorial Lecture, November 6, under the auspices of the Philadelphia Roentgen Ray Society, on "Roentgen Diagnosis and Treatment of Primary Pulmonary Neoplasm." At the time of Dr. Henry K. Pancoast's death on May 20, 1939 he was professor of radiology at the University of Pennsylvania School of Medicine and the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania.

RHODE ISLAND

New Medical Board.—Thomas B. Casey, Providence, chief of the division of examiners, announces that a new board of examiners in medicine has been appointed for Rhode Island: Dr. Joseph C. O'Connell, Providence, chairman; Dr. John A. Bolster, Providence, secretary, and Dr. Earl F. Kelly, Pawtucket.

Society News.—A panel discussion on vitamins was presented before the Providence Medical Association, October 6, by Drs. Frank J. Jacobson, William P. Buffum, Banice Feinberg, Harold G. Calder and Reuben C. Bates. All are from Providence. The association devoted its meeting November 3 to a symposium on "The Neuropsychiatric Study of the Naval Recruits." Members of the U. S. Naval Training Station, Newport, participated. Dr. James W. Sever, Boston, discussed "Colles Fractures, a Study of Pre and Post Reduction X-Rays."

TENNESSEE

Changes in Health Personnel.—Dr. Robert E. Rock, Opelika, Ala., who recently succeeded Dr. Alex B. Shipley, Elizabethton, as health director of Carter, Unicoi and Johnson counties, has been appointed associate director of venereal disease control of the state. Dr. Shipley will direct the health unit until the position has been filled.—Dr. Howard C. Stewart has been named director of the Williamson County Tuberculosis Study, Franklin, a position he formerly held until he resigned in September 1938 to become associated with the health department of Cleveland, Ohio. Dr. Stewart succeeds Dr. William J. Murphy, Franklin, who has joined the staff of the Georgia State Department of Health with offices in Decatur.

VERMONT

Dr. Beecher Appointed Dean at Vermont.—Dr. Clarence H. Beecher, professor of medicine at the University of Vermont College of Medicine, Burlington, has been appointed dean of the school to succeed Dr. Hardy A. Kemp, who has assumed a similar position at Ohio State University College of Medicine, Columbus. Dr. Beecher was born in Granville, N. Y., in 1877. He graduated at the Vermont school of medicine in 1903, serving there as instructor and demonstrator in anatomy from 1901 to 1906, instructor in medicine, 1905-1909, and assistant professor of medicine from 1909 to 1911, when he became professor. At one time he served as secretary and president of the Vermont State Medical Society.

VIRGINIA

State Medical Election.—Dr. John M. Emmett, Richmond, was named president-elect of the Medical Society of Virginia at its meeting in Virginia Beach, October 7, and Dr. Roshier W. Miller, Richmond, was inducted into the presidency. Vice presidents of the society are Drs. James W. Anderson, Norfolk, Ernest G. Scott, Lynchburg, and James P. Williams, Richlands. Miss Agnes V. Edwards, Richmond, was reelected secretary. Roanoke was chosen as the place of the annual session next year.

WASHINGTON

Society News.—A symposium on venereal disease was presented before the Pierce County Medical Society, Tacoma, October 14, by Drs. Homer W. Humiston, Leland E. Powers and Carlisle Dietrich, and MacBroom Benjamin, captain, M. C., U. S. Army, Fort Lewis, discussed "The Physician's Role in Tacoma's Home Defense."—Drs. Ralph M. L. Dodson, Portland, Ore., and John A. Kahl, Walla Walla, addressed the Walla Walla Valley Medical Society, Walla Walla, October 9, on "Preparedness from the Surgical Viewpoint" and "Preparedness from the Public Health Viewpoint" respectively.—Drs. James M. Bowers and Robert E. Mullarky, Seattle, addressed the King County Medical Society, Seattle, October 20, on "Pulmonary Emboli: Report of a Fatal Medical Case" and "Indications and Value of Peritoneoscopy" respectively. Dr. Robert D. Forbes, Seattle, discussed a case of bullet wound of the abdomen.

GENERAL

The American Woman and Her Responsibilities.—A forum on "The American Woman and Her Responsibilities" was held at Stephens College, Columbia, Mo., November 6-8. The discussion aimed to clarify the responsibilities of women in a democracy and sought a program for giving effective direction to their role as the primary force in shaping the ideals, strengths and moral fiber of a nation. Speakers of national prominence in various fields were on the program.

New Secretary of Lepers Mission.—Dr. Eugene R. Kellersberger recently returned from Bibanga, Belgian Congo, to accept an appointment as executive secretary of the American Mission to Lepers. The group held its thirty-fourth annual meeting in New York, October 9-11, with the theme devoted to "Freedom for All—from Leprosy." William Jay Schiefelin, Ph.D., presided and Dr. Kellersberger spoke on "Leprosy in the East." Dr. Kellersberger graduated at Washington University School of Medicine, St. Louis, in 1915. He has served as a medical missionary for twenty-four years in the Belgian Congo, the New York Times reported. It was announced at the session that \$293,672 had been received from 41,000 persons during the fiscal year ended June 30, the largest sum ever received by the group in any one year.

Mead Johnson Prizes.—René J. Dubos, Ph.D., of the Rockefeller Institute for Medical Research, New York, and Dr. Albert B. Sabin, associate professor of pediatrics, University of Cincinnati College of Medicine, Cincinnati, were named recipients of the E. Mead Johnson Awards by the American Academy of Pediatrics during its annual meeting in Boston, October 10. Dr. Dubos received the first award of \$500 for his work leading to the development of gramicidin, useful in the treatment of diseases caused by pathogenic bacteria, and Dr. Sabin the second award of \$300 for research in diseases of the nervous system caused by viruses. The academy chose Dr. Borden S. Veeder, St. Louis, as president-elect and inducted Dr. Edward C. Mitchell, Memphis, into the presidency. Dr. Clifford G. Grulee, Evanston, Ill., was reelected secretary. The 1942 session of the academy will be in Chicago, the dates to be announced later.

Federation Proceedings.—In March 1942 the Federation of American Societies for Experimental Biology will issue the first number of a quarterly publication to be named the *Federation Proceedings*, which will be published by an editorial board representing the five constituent societies: American Physiological Society, American Society of Biological Chemists, American Society for Pharmacology and Experimental Therapeutics, American Society for Experimental Pathology and the American Institute of Nutrition. In the past each society has printed its own abstracts in advance of the annual meeting in a separate pamphlet. After the meeting the abstracts were republished in permanent form in the journals of the various societies. In the future a single publication will suffice and abstracts of all the societies will be available in a single volume. The Yearbook will be discontinued. The *Federation Proceedings* will be distributed without charge to the one thousand seven hundred members of the federation. The subscription price will be \$4 to nonmembers. Subscriptions and other communications concerning advertising space should be addressed to Dr. Donald R. Hooker, managing editor, 19 West Chase Street, Baltimore.

Public Health Meeting.—Dr. Allen W. Freeman, Baltimore, was named president-elect of the American Public Health Association at the annual session in Atlantic City, October 16, and Dr. John L. Rice, New York, was inducted into the presidency. Other officers are Drs. Donald T. Fraser, Toronto; Eduardo Garrido-Morales, San Juan, P. R., and Pearl McIver, R.N., Washington, D. C., vice presidents; Louis I. Dublin, Ph.D., New York, treasurer, and Dr. Reginald M. Atwater, New York, executive secretary. The 1942 session will be held in St. Louis. A special session was held during the meeting to hear three representatives of the British Ministry of Health: Sir John B. Orr, director of Rowett Research Institute, Aberdeen, Scotland; Sir William Wilson Jameson, chief medical officer of the Ministry of Health, London, England, and Dr. James M. Mackintosh, professor of public health, University of Glasgow, Scotland. At a luncheon session on public health in American defense, Dr. Hugh S. Cumming, surgeon general, U. S. Public Health Service, retired, Washington, D. C., was presented with a scroll. The presentation was made by Dr. Hugh d'Amato, secretary of the National Department of Health of Argentina on behalf of the Pan American Sanitary Bureau.

Hearing on Identity of Oleomargarine Denied.—Federal Security Administrator Paul V. McNutt announced October 31 that he had notified Ralph E. Ammon, director of the State Department of Agriculture, Madison, Wis., that "it's in

the public interest" to deny the petition of the United Dairy Committee for a rehearing on the standard of identity for oleomargarine established by the Federal Security Agency. The United Dairy Committee, composed of farmers of many of the dairy states and headed by Mr. Ammon, conferred with Mr. McNutt, September 24, and appealed for a rehearing on the entire standard and particularly requested a reexamination of the legal basis for the inclusion of diacetyl as a flavoring ingredient in oleomargarine. This standard became effective on Sept. 5, 1941, following a hearing held in November 1940. After conferring with the Federal Security Agency's legal staff, the administrator said he had been advised that on the evidence already in the record there is no legal basis on which he could prohibit the use of diacetyl in oleomargarine under the authority of the Food, Drug and Cosmetic Act. Mr. McNutt pointed out that basically the definition issued for oleomargarine goes back to that contained in the oleomargarine tax law of 1886, in which Congress recognized oleomargarine as a product made in imitation of butter and imposed specific taxes on its manufacture and sale. He explained that the law authorizes the establishment of definitions and standards for foods when these will promote honesty and fair dealing in the interest of consumers. He contended that the recall of the definition and standard for oleomargarine would result in the removal of necessary protection to the buying public.

Radiological Society of North America.—The twenty-seventh annual meeting of the Radiological Society of North America will be held at the Hotel Fairmont, San Francisco, December 1-5, under the presidency of Dr. William Walter Wasson, Denver. Among the papers listed in the preliminary program are the following:

Dr. Edwin B. Boldrey, San Francisco, Pathology of Brain Tumors and Its Relation to Roentgenologic Diagnosis.

Dr. John D. Camp, Rochester, Minn., Intracranial Calcification of Non-Neoplastic Origin.

Dr. Albert K. Merchant, Stockton, Calif., Roentgen Diagnosis of Fungus Infections of the Intestinal Tract.

Dr. Ernst A. Pohle, Madison, Wis., Roentgen Therapy in Cancer of the Breast: An Analysis of Our Experience at the State of Wisconsin General Hospital During the Last Twelve Years.

Dr. James P. Rousseau, Winston-Salem, N. C., The Value of Roentgen Therapy in the Treatment of Pneumonia Which Fails to Respond to Sulfonamide Therapy.

Paul C. Aebersold, Ph.D., San Francisco, The Cyclotron and Nuclear Physics.

Dr. John H. Lawrence, San Francisco, Artificial Radioactive Elements in the Treatment of Disease.

Dr. Hymer L. Friedell, New York, Bone Lesions in Hodgkin's Disease. Medical Director Arthur H. Dearing, captain, U. S. Navy, Mare Island, Calif., The Specialist as a Medical Naval Officer.

Gioacchino Failla, Sc.D., New York, Influence of the Medium on the Radiosensitivity of Sperm.

The annual Carman Lecture will be delivered, December 2, by Dr. William Edward Chamberlain, Philadelphia, on "Fluoroscopes and Fluoroscopy."

HAWAII

Personal.—Dr. William M. Shanahan, formerly of Milwaukee, has been appointed assistant psychiatrist to the mental health clinic at Queen's Hospital, Honolulu. —Dr. Charles L. Wilbur Jr., formerly of Philadelphia, has returned to his position as director of the bureau of maternal and child health of Hawaii after a year's study at the Children's Hospital, Cincinnati. —Dr. Frederick K. Lam, Honolulu, was recently appointed general chairman of the United China Relief, Inc., for the Territory of Hawaii.

Territorial Association Publishes Journal.—The *Hawaii Medical Journal* made its appearance with the September issue. It is published by the Hawaii Territorial Medical Association with Dr. Lyle G. Phillips, Honolulu, as editorial director; Dr. Harry L. Arnold Jr., Honolulu, editor, and Miss Elizabeth D. Bolles, Honolulu, secretary and business manager. The initial issue contains papers presented before the fifty-first annual meeting of the association in May. Sections are devoted to "Plantation News," "Medical Preparedness" and "Notes and News." This year it is planned that each county medical society be responsible for one issue of the *Journal*. The November issue will be arranged for by the Honolulu County Medical Association, the January issue by the Hawaii County association, the March issue by the Maui County society and the May issue by the Kauai County society.

FOREIGN

Free Medical Care in New Zealand.—The House of Representatives, Wellington, New Zealand, on October 4 passed a measure creating a system of free medical care beginning November 1, according to the *New York Times*. The measure as adopted permits physicians to practice without direct payment by the state but without the right to collect unpaid fees through the courts. The *Times* reported that some gov-

ernment leaders fear the concessions will lead to high fees, while the patient may recover not more than the equivalent of \$1.50 a visit from the social security fund. Under its original plans the government intended to fix fees for physicians at the equivalent of \$1 for advice at offices and \$1.30 for visits to patients' homes. As a concession to the profession, which threatened to defy the government, the prices were changed to \$1.50 in both cases. Patients may now, under the amended measure, pay the physician and later get the money from the social security fund. This plan, under which the patient and not the physician receives the money, was adopted to make the maternity bonus acceptable to the physicians and permit them to be independent of the state, the *Times* reported. Finance Minister Walter Nash assured the House of Representatives on October 8 that funds were available for operation of the free medical care plan beginning November 1. The *Times* reported October 26 that Dr. Sidney D. Rhind, national secretary of the Medical Association, had announced the physicians' defiance of the government. He said doctors would attend patients at the old fees, leaving the patients to obtain from the social security fund what they could. He said further that the government had no contracts with the doctors and that physicians would not cooperate in administering the plan until their rights to go to the courts to collect unpaid fees were restored.

Government Services

Report of Surgeon General of the Navy

According to the annual report of the Surgeon General of the Navy, there were 314 deaths from all causes in 1939, giving a rate of 2.10 per thousand as compared with 2.60 for the preceding year. There were 50 deaths, including 1 suicide, caused by motor vehicle accidents. There were 42 instances of suicide and attempted suicide reported in 1939, resulting in 32 deaths. There were 4 deaths from homicide. Diseases with 127 deaths, injuries with 181 deaths, and poisonings with 6 deaths were responsible for 40.45, 57.64 and 1.91 per cent, respectively, of all deaths. There were 1,201,718 sick days from all causes in 1939, an average of 8.03 sick days per person and 19.67 per admission. There were 22.01 per cent of all personnel constantly on the sick list throughout the year. One thousand five hundred and fifty-two persons were invalided from the service as the result of physical disability in 1939, giving a rate of 10.37 per thousand as compared with 10.59 for the preceding year and 12.23, the median for the preceding nine year period. Diseases caused the invaliding of 115 officers of the navy, 23 officers of the marine corps, 840 enlisted men of the navy, 343 enlisted men of the marine corps, 99 midshipmen and 17 nurses. Injuries caused the invaliding of 10 officers of the navy, no officers of the marine corps, 66 enlisted men of the navy, 35 enlisted men of the marine corps, 4 midshipmen and no nurses. The disability was reported as existing prior to entry into the naval service in 635 cases, of which 617 were for disease and 18 for injury. In addition to 873,433 treatment days at naval hospitals there were 42,875 days for 2,042 patients on the hospital ship U. S. S. *Relief*; 3,848 days for 27 tuberculosis patients at the naval unit, Fitzsimons General Hospital, U. S. Army, Denver, and 15,975 days for 155 insane patients at the Naval Unit, St. Elizabeth's Hospital, Washington, D. C. The 12,847 admissions for venereal diseases gave a rate of 85.7 per thousand in 1939 as compared with 77.45 for the preceding year and 90.28 the median for the preceding nine year period. In 1937 action was taken to remove punitive measures imposed on enlisted men for venereal disease and 1938 was the first full year in which the effect of this step could be observed. The 1938 to 1939 increase in venereal disease incidence is 5.13 per thousand less than that of 1937 to 1938 and may reflect an additional breakdown of the attitude toward concealment of venereal disease and fear of punitive action. The report indicates that the health of the navy was good during 1939 and attributes in part the slight increase in the general admission rate over the preceding year to the induction of large numbers of recruits during the last five months of the year. The number of recruits finally accepted in the navy and marine corps was 33,312, which constituted 25.0 per cent of the average daily enlisted strength, as compared with 15.4 per cent in 1938.

One major disaster occurred in 1939 when the submarine U. S. S. *Squalus* sank off the Isle of Shoals (Portsmouth, N. H.). Twenty-three enlisted men and 1 officer lost their lives by drowning; 32 members of the crew were rescued by means of the diving bell.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 4, 1941.

The Need for Biology in Education

In an address to the British Social Hygiene Council on "Biology and Health," Sir Walter Langdon-Brown referred to the blight which had fallen on European culture, the hapless condition of university life and the subservience of scientific work to the Nazi system. The *Münchener medizinische Wochenschrift*, formerly one of the leading medical journals of the world, had become scientifically negligible and the happy hunting ground of naturopaths and other cranks who happened to catch the Fuehrer's eye. The fate of Pflügers *Archiv für die gesamte Physiologie des Menschen und der Tiere*, for more than seventy years the leading publication of physiologic and biologic research, was also significant. In 1932, the last pre-hitlerian year, it ran to five volumes; in 1938 it was one slim volume of articles mainly written by Japanese and Russians.

Biology impressed on the mind the idea of progress as the increasing complexity and adaptations of animal life were studied. If this study had been pursued with the same intensity as that of physics and chemistry, men might have become so interested in the wonderful processes of life that they would not have been so keen on inflicting death. The general public would have no adequate grasp of the principles of social hygiene until they had some idea of biologic principles. Turning to the problem of venereal disease, in which the British Social Hygiene Council is especially interested, Langdon-Brown suggested that perhaps the romanticizing tendency of the English made them unwilling to face the uncomfortable fact that behind the mystery of the continuity of life lurked the shadows responsible for venereal disease. But it was mainly ignorance of biology that was responsible for failure to realize the natural law that whenever the continuity of life was threatened the impulse to create more life was increased. There had been no sensational rise in the incidence of venereal disease in this war, as there had been in the last. But this was no reason for relaxing the efforts of the British Social Hygiene Council in dealing with the problem of venereal disease.

The Milk Supply

Among the food problems created by the war, the milk supply is one of the most important. The minister of health has made an encouraging report on the prospect for the coming winter. In the last prewar year our consumption was 70 million gallons a month. The minister estimates that the amount available in the worst month of the coming winter will be between 70 and 80 million gallons. Though greater than the prewar amount there is still a problem, as the diminished importation of milk powder and condensed milk has increased the demand for fresh milk. With some difficulty the minister has been restricting consumption to put milk into reserve for the winter in the condensed form. Condensed milk and milk powder equal to 150 million gallons of liquid milk is expected to be available, allowing a supply of 25 millions a month and bringing the total supply up to 100 millions a month, considerably in excess of any consumption that this country has known heretofore.

The supply of milk is controlled so that those with the greatest need shall have first call. Expectant mothers and babies up to the age of 5 years will get a pint daily; children up to 17 half a pint daily in addition to the amount they receive in the schools. Invalids according to their necessities will obtain up to 2 pints daily. It cannot be assumed that we could give these priorities and go on with unrestricted use of milk elsewhere. Last winter children were short of milk in

some parts of the country. The minister is therefore asking the fighting services to take much larger quantities of condensed milk, which is particularly suited for their use. A limit will be put on the quantities of liquid milk that can be supplied to catering establishments. They will be given condensed milk and milk powder, which they can use for cooking. For the preparation of meals in schools, milk powder will be used. There will be ample quantities of condensed milk to meet the reasonable needs of every section of the people. It is estimated that a family of six with two children under 5 and two under 17 will be able to get 25 pints of liquid milk weekly, excluding the amount obtained at school. In a small family with one child under 3, 11 pints will be available weekly. Two adults will probably get 4 pints weekly. In addition to all this, supplies of condensed milk will be available when the winter supply of liquid milk is at its lowest. This should be equal to about a further 3 pints of liquid milk a family per week. These represent the minimum figures.

Injuries of the Locomotor System

The war has produced a need for more surgeons with training and experience in the diagnosis and treatment of injuries of the locomotor system. Arrangements have therefore been made for instructional courses extending over six weeks. The surgeons attending the courses will be divided into groups of not more than four, which will be attached to the wards and outpatient department of a senior surgeon experienced in this work. They will have charge of cases, carry out treatment and receive practical demonstrations. They will also do the work and teaching of neighboring hospitals, fracture departments and clinics. The first course will begin at Liverpool, the city which inherits the great orthopedic traditions of Thomas and of Jones. The courses will be conducted by such well known orthopedic surgeons as R. Watson-Jones, T. P. McMurray, B. L. McFarland, F. C. Dwyer, G. E. Thomas and W. R. Mitchell. This course is designed for surgical specialists both in the fighting services and in the emergency medical service (for civilian casualties). The number of entries will be limited to sixteen, for whom accommodation will be arranged in the neighborhood of one of the hospitals.

Norwegian Hospital in London

A Norwegian hospital for the men of the Norwegian Navy and Merchant Service has been in existence for about a year. It has forty-five beds, of which forty are at present occupied. It is staffed entirely by Norwegian physicians and nurses, and the members of the staffs are mainly Norwegian ex-service men. The hospital was inspected by the crown prince of Norway, Prince Olaf, who talked with seamen who served in the Lofoten raid.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 15, 1941.

Control of Tuberculosis in Argentina

The recently formed Comisión Nacional de la Tuberculosis consists of a president, vice president, general secretary and four members, all in office for a term of six years. This commission is to take over the technical and administrative direction of all tuberculosis hospitals, sanatoriums and similar institutes supported with state funds and the technical direction and the administrative control of private institutes subsidized by the state. The commission will erect eighteen city hospitals and twelve rural sanatoriums in various regions; these had already been provided for by the law in question but had not been erected as yet. Further tasks are the erection of schools for the training of personnel, the compilation of statistics, the arrangement of meetings and lectures, education of the public, control of mutual aid societies and the supervision of medications. The commission is to concern itself also with the obligation of reporting cases of tuberculosis and with special

tion. The establishment of provincial and territorial subcommissions is provided for. Prophylactic measures are also to be taken. Organizations that are concerned with the campaign against tuberculosis cannot be founded without approval of the *Comisión Nacional*.

To begin the examination of the population for tuberculosis, the government of Argentina has issued a decree which obliges all government employees, officials and workers to submit to periodic examination for tuberculosis. Those found to be tuberculous are to receive the leave of absence provided for in an earlier decree, and admission to the large tuberculous hospital "Hospital Nacional Central."

The annual report on the campaign against tuberculosis in Buenos Aires appeared recently. The municipal organization is concerned not only with the hospital and polyclinic treatment, obstetric care for tuberculous women, isolation of the children of tuberculous parents, support of colonies at the seashore and detection of undiscovered cases of tuberculosis but also with the therapeutic, prophylactic and social side of the problem. Although the mortality has been reduced, tuberculosis is still a problem for which neither the available public nor private means are adequate. The number of beds is insufficient to care for all tuberculous patients who are in need of institutional care. According to reports, the five thousand beds available in the tuberculosis hospitals in Buenos Aires and various regions of the country do not meet one third of the requirements.

The sensational press of Buenos Aires has been concerned for months with a new tuberculosis vaccine developed by one Jesús Pueyo. This man is a student aged 40, a Spaniard, who for a time was an assistant at the microbiologic institute. He asserts that he developed a vaccine with curative and prophylactic properties against tuberculosis. The faculty of Buenos Aires was willing to perform an investigation, but Pueyo refused. He demanded that his vaccine be used first for the treatment of human subjects, whereas the investigating commission wanted to begin with an experimental examination. The further course was the following: Pueyo appealed to the minister of the interior, who suggested an examination in the bacteriologic institute of the Departamento Nacional de Higiene with special concessions for Pueyo, but here again Pueyo made impossible demands. Pueyo now attempts further distribution and application of his vaccine, although he knows that legal regulations prohibit this; the president of the Departamento Nacional de Higiene, on the basis of existing laws, has now decreed a fine of 1,000 pesos. The minister of the interior had previously ruled that Pueyo could use his vaccine for scientific research but not for public distribution. The case was discussed also in the Argentine parliament. It was pointed out that the behavior of Pueyo had created an unfavorable impression. The same critical stand was taken by a medical commission appointed by the ministry for public health in Uruguay. On the basis of the available evidence and of former experiences with such preparations, the Pueyo case may be regarded as closed as far as science is concerned.

Campaign Against Trachoma in Argentina

Dr. José A. Cená, chief of the section on trachoma of the Departamento Nacional de Higiene, has issued a report on the campaign against trachoma in Argentina. Trachoma became particularly serious after the eighth decade of the last century. Although in Buenos Aires the spread of trachoma has been so effectively counteracted that the capital is now practically free from it, trachoma is still on the increase in the interior. After extensive observations an investigating committee was appointed in 1923 and a section for the prophylaxis of trachoma and infectious eye diseases was founded at the beginning of 1924 in the Departamento Nacional de Higiene. Dispensaries were opened, but their activity was rather restricted owing to lack of funds. In 1927 the ophthalmologist Prof. Ernst Fuchs made

a tour of investigation and ascertained that in spite of expressed doubts the existing disorder was true trachoma. Since 1935 the campaign against trachoma has been intensified and has been carried into the schools; the school children are examined for trachoma and if necessary are treated. Sulfanilamide has recently been used with considerable success for this purpose.

Health Organizations in Paraguay

The health conditions of Paraguay were recently presented in an official report. The organization of public health matters in Paraguay began with the formation of the national hygienic council (*Consejo Nacional de Higiene*) in 1889. Regulations regarding the practice of medicine have existed since 1900. The national commission for public aid and social welfare was founded in 1915 when the *Consejo Nacional de Higiene* was converted into the Bureau for public health matters. In 1917 the two were combined under the name *Departamento de Higiene y Asistencia Pública*. This organization existed until 1936, when the ministry for public health was established. This ministry has five departments: *Asistencia Pública* in the capital, rural hygiene, hygiene in general, child welfare and dentistry. At the request of the government the ministry was reorganized in 1940 by Dr. Henry Hanson, member of the *Oficina Sanitaria Panamericana*.

The most important medical problem in Paraguay is infant mortality. To counteract the extreme undernourishment of children, particularly in rural regions, 15 per cent of the rural taxes have been allotted for feeding children in the schools, an arrangement already carried out in eighty localities.

Leprosy is the second important problem. Abdominal typhoid and other forms of typhoid will be more effectively counteracted when Asunción and other large cities have been equipped with proper sewerage systems. Vaccination against typhoid is obligatory for school children. Malaria became a national catastrophe in 1940; fourteen commissions were established, which distributed more than 500,000 quinine tablets and other preparations. About 30,000 patients were treated. Petroleum was used to eradicate the breeding grounds. *Ancylostomiasis* is likewise widely disseminated. The tuberculosis mortality is relatively high, although it has somewhat decreased in recent years; however, the tuberculosis morbidity has increased.

In the rural hospitals, special departments are to be established for infants. Of 4,700 children in the capital, 4.8 per cent were found to have trachoma.

Brief Reports

The bacteriologic institute of the Departamento Nacional de Higiene in Buenos Aires celebrated its twenty-fifth anniversary in June; since then it has borne the name of its founder, Dr. Carlos J. Malbrán. Several new laboratories were opened at the time of the celebration.

During July a number of Argentinian physicians visited the university of Rio de Janeiro. At the same time Rio de Janeiro had an exhibit of paintings, sculptures and photographs created by Argentinian physicians. A library of Argentinian medical authors, selected by Dr. Juan Ramón Beltrán, professor of history of medicine at the university of Buenos Aires, was presented to Getulio Vargas, the president of Brazil.

The seventh Congreso Nacional de Medicina, which will be held in La Plata in 1943, will have as its subjects rheumatism and arterial hypertension.

James Ewing of New York held conferences on malignant neoplasms at the invitation of the faculty of medicine of Rosario and also in Buenos Aires. From Buenos Aires he went to Santiago, Chile.

Prof. Ernest Carroll Faust, parasitologist of Tulane university, at the invitation of the faculty of medicine of Buenos Aires, recently held a number of conferences on his specialty.

A recent art exhibit in Buenos Aires presented paintings and pieces of sculpture created by physicians.

Deaths

James Norment Baker * Montgomery, Ala.; University of Virginia Department of Medicine, Charlottesville, 1898; secretary of the Alabama State Board of Censors and state health officer; in 1934 elected to the executive committee and in 1936-1937 was president of the Federation of State Medical Boards; was a member of the National Board of Medical Examiners of the United States and a member of the executive committee; since 1930, with the exception of 1934, was a member of the House of Delegates of the American Medical Association and chairman of the Section on Preventive and Industrial Medicine and Public Health, 1932-1933; member of the Southern Surgical Association; past president and secretary of the Medical Association of the State of Alabama; fellow of the American College of Surgeons; as a fellow of the American Public Health Association had an active part in its various activities, having served as chairman of the section on public health officers and as a member of the executive committee and governing council of the association; past president of the Southern Branch, American Public Health Association; past president of the Conference of State and Provincial Health Authorities of North America; served as a major in the medical corps of the United States Army during the World War; in 1940 chairman of the National Malaria Committee; state chairman for Alabama of the Committee on Medical Preparedness of the American Medical Association; aged 65; died, November 9, of coronary occlusion.

Joseph Storer Wheelwright * New York; Cornell University Medical College, New York, 1900; associate in physiology from July 1, 1914 to June 30, 1919 and instructor in surgery from July 1, 1919 to June 30, 1920; fellow of the American College of Surgeons; served during the World War; president of the medical board and chief of the staff of the Southampton (N. Y.) Hospital; member of the board of consultants of the Columbia-Presbyterian Medical Center; secretary of the board of the Doctors Hospital; aged 65; died, October 9, of cerebral hemorrhage while at Long Point, 30 miles southwest of Simcoe, Ont.

Ira Alphonso Darling * Torrance, Pa.; University of Vermont College of Medicine, Burlington, 1911; fellow of the American College of Physicians; member of the American Psychiatric Association; superintendent of the Torrance State Hospital; formerly superintendent of the Warren (Pa.) State Hospital and the Springfield State Hospital, Sykesville, Md.; member of the executive committee of the mental hygiene division, Public Charities Association of Pennsylvania; served during the World War; aged 53; died, October 10, of coronary thrombosis.

Ollie Paxton Board * Birmingham, Ala.; Louisville (Ky.) Medical College, 1903; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; served during the World War; past president of the Jefferson County Medical Society; visiting surgeon, South Highlands Infirmary and the Hillman Hospital; aged 59; was killed, October 15, near Athens, Ohio, in an automobile accident.

George Fordham * Powellton, W. Va.; University of Virginia Department of Medicine, Charlottesville, 1907; fellow of the American College of Physicians; past president of the Fayette County Medical Society; veteran of the Spanish-American and World wars; formerly on the staff of the Morris Memorial Hospital for Crippled Children, Milton; aged 63; died, October 4, of coronary occlusion.

Arthur Bacon Breese, Syracuse, N. Y.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1881; professor emeritus of clinical gynecology at the Syracuse University College of Medicine; fellow of the American College of Surgeons; surgeon, Memorial Hospital; consulting surgeon, Onondaga General Hospital; aged 83; died, October 13.

Emil Otto Ficke, Davenport, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; served during the World War; formerly county and city physician; for many years physician for the county insanity commission; aged 61; died, October 7, in the Mercy Hospital following an operation on the gallbladder.

William A. D. Dyke, Washington, D. C.; Georgetown University School of Medicine, Washington, D. C., 1929; first lieutenant in the medical corps of the U. S. Army from Dec. 3, 1932 to Jan. 7, 1935; acting assistant surgeon, United States Public Health Service; formerly a lawyer; aged 49; was killed, September 27, in an automobile accident at Tacoma, Wash.

Herbert D. Gardner, Miami, Fla.; Jefferson Medical College of Philadelphia, 1880; past president and secretary of the Lackawanna County (Pa.) Medical Society; at one time coroner

of Lackawanna County, Pa.; staff surgeon, Scranton Private Hospital, from 1899 to 1925; staff surgeon, Scranton State Hospital, from 1900 to 1910; aged 85; died, October 13.

Walter Speisser Goodale, Buffalo; University of Buffalo School of Medicine, 1903; member of the Medical Society of the State of New York; professor of hygiene and public health emeritus at his alma mater; superintendent of the Edward J. Meyer Memorial Hospital (Buffalo City Hospital); aged 66; died, October 8, of coronary thrombosis.

James Vane Seids * Cleveland; Western Reserve University School of Medicine, Cleveland, 1920; fellow of the American College of Surgeons; senior clinical instructor in surgery at his alma mater; aged 47; on the staffs of the City Hospital and St. Luke's Hospital, where he died, October 11, of amyotrophic lateral sclerosis.

Ernest Page Fuller, Lawrence, Mass.; University and Bellevue Hospital Medical College, New York, 1899; member of the Massachusetts Medical Society; on the staff of the Lawrence General Hospital; aged 68; died, September 14, of carcinoma of the prostate with metastases to the pelvic bones and left femur.

Henry Thomas Sutton, Zanesville, Ohio; Medical College of Ohio, Cincinnati, 1885; member of the Ohio State Medical Association; fellow of the American College of Surgeons; at one time health officer; aged 79; one of the founders of the Good Samaritan Hospital, where he died, October 1, of pernicious anemia.

George R. Sledge, Parksley, Va.; University of Maryland School of Medicine, Baltimore, 1903; member of the Medical Society of Virginia; also a pharmacist; at one time chairman and member of the county school board; aged 61; died, October 3, in the Lenox Hill Hospital, New York, of coronary thrombosis.

Karl Stanley Simpson, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1903; member of the Medical Society of the State of Pennsylvania; veteran of the Spanish-American and World wars; aged 62; on the staff of the Shadyside Hospital, where he died, October 8, of coronary sclerosis.

Isaac N. Hatfield, Bluffton, Ind.; State University of Iowa College of Medicine, Iowa City, 1884; member of the Indiana State Medical Association; past president and secretary of the Wells County Medical Society; aged 85; died, October 13, in the Wells County Hospital of chronic myocarditis.

Curt Benno Hardt * Woodmere, N. Y.; Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main, Prussia, Germany, 1933; formerly clinical assistant in medicine on the staff of the Hospital for Joint Diseases, New York; aged 32; died, October 16, of pneumonia.

Charles Slater, South Ozone Park, N. Y.; University of Glasgow Medical Faculty, Scotland, 1934; member of the Medical Society of the State of New York; member of the Canadian Army Medical Corps; aged 37; was found dead, October 2, in Toronto, Ont., Canada.

George Arnold Holm, Washington, D. C.; University of Minnesota Medical School, Minneapolis, 1915; member of the Medical Society of the District of Columbia; senior medical officer of St. Elizabeth Hospital; aged 53; died suddenly August 25, of coronary thrombosis.

Andrew Gustavus Sandblad, McKeesport, Pa.; Omaha Medical College, 1894; member of the Medical Society of the State of Pennsylvania; aged 75; on the consulting staff of the McKeesport Hospital, where he died, October 5, of cerebral hemorrhage and arteriosclerosis.

John Charles Frey * Syracuse, N. Y.; Syracuse University College of Medicine, 1920; aged 45; on the staff of the Hospital of the Good Shepherd, Syracuse University, where he died, October 8, of acute appendicitis, pyelophlebitis and streptococcal viridans septicemia.

Henry Norris, Bryn Mawr, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; member of the Medical Society of the State of North Carolina; fellow of the American College of Surgeons; served during the World War; aged 66; died, October 6.

Thomas Ap Roger Jones, Knoxville, Tenn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Tennessee State Medical Association; served during the World War; aged 74; died, October 9, in the Knoxville General Hospital.

Kenneth M. Kelley, Texarkana, Ark.; Memphis (Tenn.) Hospital Medical College, 1899; formerly county health officer, and mayor; for many years on the staff of the Michael Meagher Hospital; aged 81; died, October 5, of uremia, diabetes mellitus and carcinoma of the larynx.

Jesse M. Shackelford, Martinsville, Va.; Baltimore Medical College, 1891; member and formerly vice president of the West Virginia State Medical Association; physician and owner of a hospital bearing his name; aged 71; died, October 2, of cerebral hemorrhage.

George Abell Russell, Boonville, Mo.; Hahnemann Medical College and Hospital, Chicago, 1888; member of the Missouri State Medical Association; formerly county coroner and county and city health officer; aged 80; died, October 2, of pernicious anemia.

Jack Richard McMichael Ⓢ Quitman, Ga.; University of the South Medical Department, Sewanee, Tenn., 1907; chairman of the county board of health; formerly member of the state board of health; aged 57; died, October 6, of coronary thrombosis.

Harry T. Harter, Newtonville, Ind.; Louisville (Ky.) Medical College, 1898; member of the Indiana State Medical Association; aged 72; died, October 16, at St. Joseph's Hospital, Lexington, Ky., of adenocarcinoma of the sigmoid with metastases.

Theodor Adolph Tosch, Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1911; served during the World War; aged 68; died, September 27, in the Deaconess Hospital of cerebral hemorrhage and hypertension.

Albert Edward Sutton, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1909; served during the World War; on the staff of the Toronto East General Hospital; aged 55; died, October 5, of injuries received when struck by a train.

George Thomas McMurray, Farmingdale, N. Y.; Long Island College Hospital, Brooklyn, 1906; at one time on the staffs of the Hospital of the Holy Family and St. Mary's Hospital, Brooklyn; aged 57; died, October 6.

Le Roy Isaac Walker, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1901; aged 63; on the staff of the Women's Homeopathic Hospital, where he died, September 30, of bronchogenic carcinoma.

Robert Ambrose Joyce, Monroe, N. Y.; Bellevue Hospital Medical College, New York, 1873; at one time surgeon for the fire department of the city of New York; aged 90; died, October 16, of cerebral hemorrhage.

Mary Hadley Smith, Long Beach, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; formerly resident physician at the Willard (N. Y.) State Hospital; aged 85; died, October 8.

John Willis Conley Bowman, Brookhaven, Miss.; Mississippi Medical College, Meridian, 1907; aged 63; died, August 13, in the King's Daughters' Hospital of cerebral thrombosis, arteriosclerosis and hypertension.

Thomas J. Stephenson Ⓢ Anderson, Ind.; Illinois Medical College, Chicago, 1898; on the staff of St. John's Hickey Memorial Hospital; aged 73; died, October 5, of cerebral hemorrhage and myocarditis.

Frederick Hugh Goddard Ⓢ Rochester, N. Y.; Western Reserve University Medical Department, Cleveland, 1889; aged 77; died, October 12, in the Highland Hospital of arteriosclerosis and heart disease.

John Voyt Wilson Ⓢ Pittsburgh; University of Pittsburgh School of Medicine, 1913; aged 53; died, October 2, in the Allegheny General Hospital of hypertension, coronary disease and cholelithiasis.

Nathaniel P. Moss, Roanoke, Va.; Medical Department of Tulane University of Louisiana, New Orleans, 1887; for many years bank president and president of the school board; aged 77; died, October 10.

John Roscoe Steagall, Portland, Ore.; Rush Medical College, Chicago, 1912; served during the World War; aged 63; died, September 25, of coronary thrombosis, sclerosis and angina pectoris.

John William Eustace, Buffalo; University of Buffalo School of Medicine, 1930; member of the Medical Society of the State of New York; aged 36; died, October 11, of coronary thrombosis.

Joseph Hardy, St. Louis; Washington University School of Medicine, St. Louis, 1892; member of the Missouri State Medical Association; aged 80; died, October 14, in St. John's Hospital.

James Poesy Wood, Cedar Grove, Ga.; University of the South Medical Department, Sewanee, Tenn., 1901; member of the Medical Association of Georgia; aged 71; died, September 29.

David Franklin Longenecker, San Diego, Calif.; Jefferson Medical College of Philadelphia, 1876; aged 87; died, October 2, of uremia and prostatic hypertrophy with obstruction.

Alonzo Atchison Cotton, Detroit; State University of Iowa College of Homeopathic Medicine, Iowa City, 1886; aged 79; died, October 7, of uremia, acute nephritis and hypertension.

Allston Moore Willcox, Conway, S. C.; Medical College of the State of South Carolina, Charleston, 1913; served during the World War; aged 53; died in October at Manning.

Kenneth George Theis Ⓢ Nyack, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York, 1928; aged 40; died, October 16, of malignant hypertension.

Albert B. Hagerthy, Ashland, Maine; Medical School of Maine, Portland, 1903; member of the Maine Medical Association; for many years coroner; aged 62; died in October.

Edward Dwight Chapman, Daytona Beach, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; aged 87; died, September 17, of myocarditis.

Jennie A. Sausser Green, Portland, Texas; Woman's Medical College, Chicago, 1890; aged 83; died, October 4, in Winston-Salem, N. C., of cerebral hemorrhage.

Stanley Gordon Herbert, Winnipeg, Man., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1919; aged 46; died, September 28, of asphyxiation.

Josiah B. Keylor, Cochranville, Pa.; College of Physicians and Surgeons, Baltimore, 1885; bank president; aged 83; died, October 17, in the Coatesville (Pa.) Hospital.

Robert Dellen Harper Ⓢ Loneoak, Ky.; Barnes Medical College, St. Louis, 1902; president of the McCracken County Medical Society; aged 62; died, October 16.

A. J. Odom, Berlin, Ga.; University of Georgia Medical Department, Augusta, 1905; member of the Medical Association of Georgia; aged 64; died, October 6.

Sumner S. Bever, Amazonia, Mo.; Northwestern Medical College, St. Joseph, 1888; formerly county coroner; aged 74; died, October 7, of cerebral hemorrhage.

Maurice Simon Avidan Ⓢ Newark, N. J.; College of Physicians and Surgeons, Baltimore, 1910; served during the World War; aged 53; died, October 17.

William J. Blackburn, Salem, Ohio; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 79; died, October 5, of carcinoma of the prostate.

A. Frank Lampman, Wilkes-Barre, Pa.; Baltimore Medical College, 1894; aged 68; died, October 10, in the Wilkes-Barre General Hospital of coronary occlusion.

Percival John Abbott, Detroit; Detroit College of Medicine, 1911; aged 58; died, October 7, in the Grace Hospital of intussusception and diffuse peritonitis.

Ora E. Throckmorton, Battle Ground, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1897; aged 74; died, October 4, of paralysis agitans.

Frank George Hope, Sioux City, Iowa; Sioux City College of Medicine, 1906; member of the Iowa State Medical Society; aged 58; died, October 13.

Richard Sawyer Blanchard, Honolulu, Hawaii; Harvard Medical School, Boston, 1940; intern at the Queen's Hospital; aged 28; died, September 27.

Sallie Jones Jagers, Washington, D. C.; Eclectic Medical College of the City of New York, 1887; aged 92; died, October 26, of arteriosclerosis.

Samuel G. Kennedy, Tulsa, Okla.; Kansas City (Mo.) Medical College, 1898; aged 76; died, September 27, of endocarcinoma of the prostate.

James Dean MacDonald, Huntsville, Ont., Canada; Western University Faculty of Medicine, London, 1907; aged 66; died, October 5.

Jacob DeVries, Grand Rapids, Mich.; Physio-Medical College of Indiana, Indianapolis, 1890; aged 77; died, October 7, of mitral regurgitation.

Eckley G. Sharp, Guthrie, Okla.; Eclectic Medical Institute, Cincinnati, 1893; aged 75; died, September 6, of cerebral hemorrhage.

Arsine Arthur Lefebvre, Montreal, Que., Canada; University of Montreal Faculty of Medicine, 1924; aged 43; died, September 4.

James Alexander Phillips, Brantford, Ont., Canada; Trinity Medical College, Toronto, 1887; aged 75; died, September 4.

Rozell Berryman, Baltimore; Baltimore Medical College, 1893; aged 80; died, October 1, of carcinoma of the stomach.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Activanad.—Charles J. Ahsbahr, trading as Neo-Products Company of America, New York, promised the Federal Trade Commission in December 1940 to discontinue certain misrepresentations in the sale of this product. Among them were that the thing is praised or recommended by eminent physicians or psychiatrists; that it strengthens the body or benefits persons afflicted with fear, anxiety, irritability, worry or fatigue; that it prevents chronic disorders or has any therapeutic value in the prevention of any ailment or disease; that it builds up the body, promotes formation of new blood, strengthens the muscles, promotes sleep, acts as an effective aphrodisiac, or does some other things. In the same month Lester Meyers, New York, who conducts an agency which handles the "Activanad" advertising, also promised the Commission that he would discontinue these misrepresentations.

Beauty Builder and Beauty Fount.—These are vapor-electric bath cabinets put out by the Gellman Manufacturing Company, Rock Island, Ill. In December 1940 the concern signed a stipulation with the Federal Trade Commission promising to cease representing that these cabinets have a direct value in permanent reduction of weight; that by means of vapor heat or infra-red or ultraviolet rays these devices help eliminate excess fat, that they rid the body of harmful toxins or "cure" or "banish" or "crase" fatigue or benefit nervous or underweight persons.

Darmela Products.—These include "Darmela Salve" and "Darmela Liquid" and are put out by Joseph H. Miller, trading as Darmela Laboratory, Chicago. In November 1940 the Federal Trade Commission reported that it had got him to agree to cease representing that either of his products is a competent treatment or effective remedy for open or running wounds or sores (cutaneous ulcers) unless it is explained in direct connection therewith that they will have no effect on the condition when it is due to varicose veins, tuberculosis or syphilis; that either is a competent treatment for shingles, except possibly for relief of the pain and itching; that Darmela Liquid is a competent treatment for stiffness, numbness, paralytic stress and some other conditions, except as it may give temporary relief from pain or discomfort associated with those conditions. Miller also promised to cease representing that the liquid is effective for coughs or colds or that he owns, controls or operates a laboratory.

Digesto-Pep and Coldlax.—Smith Brothers Drug Company of Greensboro, N. C., signed a stipulation with the Federal Trade Commission in December 1940 promising to discontinue certain misrepresentations in the sale of these two products. Among them were that "Digesto-Pep" is a remedy for stomach disorders or will do more than temporarily relieve stomach discomforts associated with gastric hyperacidity, or enable a person to eat whatever he wishes without discomfort; or that "Coldlax" will attack a cold at the seat of the trouble or do anything more than temporarily relieve its symptoms.

Entromul.—This was represented in the advertising to be valuable in the treatment of various stomach and intestinal disturbances, particularly those due to excess acid, putrefactive germs in the intestine or simple mucous colitis. In December 1940 Thomas J. McBride, trading as the Entromul Company of Los Angeles, promised the Federal Trade Commission that he would discontinue these misrepresentations. The stipulation that he signed was supplemental to one accepted by the Commission in February 1937, the terms of which were still in effect. Following up his stipulation in December 1940, the N. J. Newman Advertising Agency of Los Angeles signed a similar one, promising to discontinue the misrepresentations mentioned.

F. K. Invisible Nasal Filter.—This was represented by the F. Koehler Manufacturing Company, Inc., of Newport, Ky., as competent to relieve the discomforts of hay fever, rose fever, sinus infections and asthma, protect the nasal passages from pollen and give effective relief for headaches caused by gasoline fumes or for coughing or a phlegm-filled throat condition caused by asthma or sinus infection. In November 1940 the Koehler concern promised the Federal Trade Commission that it would discontinue these misrepresentations.

House of Westmore Cosmetics.—These are put out by a Ferce H. Westmore and the House of Westmore, Inc., Burbank, Calif. In November 1940 this person promised the Federal Trade Commission that he would cease representing that cosmetics in general contain undesirable or unflattering colors which may give a harsh or aged appearance, whereas the House of Westmore cosmetics have had the color filtered out of them.

Nix Deodorant Cream.—This was put out by one P. Edwards, trading as the Nix Cosmetics Company, Memphis, Tenn. In December 1940 he signed a stipulation with the Federal Trade Commission to cease representing that his cream stops the flow of perspiration or its odor for days; that it affects these conditions in a new way or neutralizes or has any other substantial effect on perspiration acids. In January 1941 Cole and Company of Memphis, which handles the Nix advertising, signed a similar stipulation with the Commission.

Ofria.—This product, also known as L'Unguento Ofria, Ofria Pile Remedy and Ofria Ointment, was put out by one Maria Ofria of Brooklyn, trading under the name of Philip Ofria. In November 1940 the Federal Trade Commission reported that it had got her to sign a stipulation promising to cease representing that her product will cure or dry up hemorrhoids, pruritus and similar troubles or that it will afford lasting relief. She also agreed to cease using the word "remedy" in the trade name of this product or any other mixture of similar composition.

Peano-Oil.—This was put out by six co-partners who traded as the Peanut Products Company, Tuskegee, Ala. In November 1940 the Federal Trade Commission reported that it had got these persons to agree to cease representing that the use of their product will result in healthy hair, will restore the natural oil of the hair, will prevent hair from falling out or becoming brittle or prevent baldness; or that it nourishes the scalp or that it is the discovery of an eminent scientist.

Pilot Health Course.—This was exploited by a Charles B. McFerrin, Orlando, Fla., who also published the *Spot Light Magazine*. McFerrin for years has represented himself as a "diet specialist." In November 1940 the Federal Trade Commission got him to sign a stipulation agreeing to cease from representing that his magazine contains information of any value whatever for any disease or affliction, including gallbladder trouble, liver disorders, rheumatism, anemia and other ailments; or that "The Pilot Health Course" offers any conceivable benefit to sinus trouble, bronchitis, asthma and some twenty-five other disorders, or enables one to have health, prosperity or happiness.

Pow-A-Tan Herb Tonic.—The Pow-A-Tan Medicine Company, Huntington, W. Va., put this out under the misrepresentations that it was a cure or remedy or competent treatment for all common ailments, such as rheumatism, neuritis, arthritis, indigestion, hemorrhoids, la grippe, lumbago and similar complaints. In November 1940 the concern stipulated with the Federal Trade Commission that it would discontinue these misrepresentations and a few others.

Q-Loid.—The Magay Corporation of New York, in January 1941, stipulated with the Federal Trade Commission that it would cease representing that "Q-Loid" would accomplish results similar to those obtained by injections of colloidal sulfur or that it was an effective remedy for arthritis beyond furnishing temporary symptomatic relief in some forms of arthritis when there is a sulfur deficiency. In 1938 government chemists reported that Q-Loid consisted of white tablets and yellow ones, the first containing 5 grains (0.3 Gm.) of acetylsalicylic acid per tablet and the second, sulfur (from 0.2 to 0.4 grain [0.013 to 0.026 Gm.]) and antipyrine (0.2 to 0.3 grain [0.04 Gm.]) per tablet. At that time the government declared that Q-Loid was fraudulently represented as a remedy for arthritis, rheumatism and allied conditions.

Ramstead Treatment.—The Ramstead Company, Inc., Milwaukee, having promoted this product as a competent treatment for stomach ailments generally, whose use would enable a person to tolerate all kinds and types of foods and would act as a substitute for surgical treatment of gastric ulcers, signed a stipulation with the Federal Trade Commission in November 1940 promising to discontinue these and other misrepresentations. The stipulation was supplementary to one that the same company had made with the Commission in February 1932.

Rose Laird Cosmetics.—These were put out by a Rose Helen Kingstone, trading as R. H. Laird Company and Rose Laird, New York, who in December 1940 promised the Federal Trade Commission to discontinue certain misrepresentations in her advertising. Among these were that "Rose Laird's Greaseless Lubricant, Protective Face Lotion, Overnight Cream, and Liquid Facial Soap" alone or in combination would correct blemishes or other cutaneous ills or enable one to acquire or retain a clear skin; or that by use of the product one would not have a bumpy skin, excess oil, eruptions, coarse pores or blackheads. In January 1941 similar promises were made to the Commission by AW-Advertising, Inc., of New York.

Stuart's Tablets.—Apparently this is the product that used to be sold as "Stuart's Dyspepsia Tablets." In December 1940 the F. A. Stuart Company, Marshall, Mich., and Benson & Dall, Inc., Chicago, an advertising agency, promised the Federal Trade Commission to cease representing that these tablets are a remedy for any dysfunction of the stomach, or more efficacious as an antacid than any similar preparations, have any other action on the stomach than temporary relief of acidity or prevent the occurrence of any dysfunction of the stomach.

Vapo-Cresolene.—In November 1940 the Federal Trade Commission announced that it had got the Vapo-Cresolene Company, Chatham, N. J., to sign a stipulation to discontinue certain misrepresentations in its advertising of this product. Among these were that Vapo-Cresolene is a competent treatment for colds or a remedy for spasmodic or ordinary croup, whooping cough, "children's diseases," pneumonia, influenza or deep chest colds.

Wonder Glo.—Werner Walter, trading as Wonder Products Company, Canton, Ohio, promised the Federal Trade Commission in August 1940 that he would discontinue representing that this alleged cleaner and water softener, put out also as a shampoo, has any particular value when used as a shampoo aside from its power to soften hard water.

Correspondence

HYPERSENSITIVITY TO SULFATHIAZOLE

To the Editor:—In THE JOURNAL, October 18, page 1378, under correspondence, Dr. Merritt H. Stiles calls attention to what he considers an omission in the table appearing in the article by Dr. E. P. Lieberthal and me (Pemphigus Follicular-like Eruption Following Use of Sulfanilamide and Sulfapyridine, THE JOURNAL, September 6, p. 850). This table, which was presented by Dr. Perrin Long as a summary of the clinical toxic manifestations of sulfanilamide, sulfapyridine and sulfathiazole was, in my estimation, a superlative tabulation of information up to the time the table was presented by Dr. Long before the Pan American Scientific Congress on May 15, 1940. The status of sulfanilamide, its related drugs and their toxic manifestations is still in a state of flux, as revealed by the great number of contributions to the literature listed in recent editions of the *Quarterly Cumulative Index* dealing with the various phases of the clinical application of these drugs and their toxic sequelae. In the table it is stated that nausea and vomiting following sulfathiazole is rare, and it is my feeling that Dr. Stiles's communication referring to his article in the *Pennsylvania Medical Journal* is simply further corroboration of this statement in Dr. Long's table.

MAX S. WIEN, M.D., Chicago.

MARRIAGE IN EPILEPSY

To the Editor:—I realize that answers to the questions propounded in Queries and Minor Notes must be brief, but a half answer may be worse than none. This is the case in the answer to "Marriage in Epilepsy" on page 1402 of the issue of October 18. Largely on the basis of the electroencephalographic evidence which my associates and I have gathered, the writer states that the only hope of eliminating epilepsy is by birth control among epileptic adults. He overlooks the fact that the brain wave studies indicate that for every epileptic patient there are probably twenty or more nonepileptic patients who nevertheless are carriers of this or an allied disorder. Therefore, childlessness of all persons with epilepsy would eliminate only 5 per cent of epilepsy. Prohibitions applied to a person with epilepsy apply with equal force to one half of his relatives and to something like 10 per cent of the whole population. Again, the probability of having affected progeny depends in part on whether the person whom the epileptic person marries carries a predisposition to epilepsy. The marriage of two normal carriers of this disorder is more dangerous than the marriage of an epileptic person to a noncarrier. Logically brain wave tracings of both partners to a marriage should be secured if the physician is to offer specific advice to an individual. Even so he should consider the possibility suggested by unpublished observations that unusual, so-called "abnormal" frequency of waves may be associated with high attainment or genius. Many implications of electroencephalography are as yet unexplored.

This technic is not yet available for most epileptic persons who may wish to marry. However, the degree of inheritance of epilepsy is greater in some individuals than in others, and there is certain statistical evidence which makes the outlook relatively favorable for the patient whose history is given: her family history is unmarred, her mentality is normal, and seizures began relatively late in life. Furthermore, her other physical and mental characteristics, which presumably are also transmittable, are socially desirable. If she will select a mate whose family and personal history are as clear as her own, there is less than one chance in twenty that one of her two children, if she has but two, will have epilepsy. Whether she wishes to

take this chance is something she, and not her doctor, will need to decide.

The correspondent asked for references. The latest summing up of evidence will be found in the article on the inheritance of cerebral dysrhythmia and epilepsy in the *Archives of Neurology and Psychiatry* 44:1155 (Dec.) 1940 and in Erickson, Theodore, and Penfield, Wilder: *Epilepsy and Cerebral Localization*, Springfield, Ill., Charles C. Thomas, 1941, and in Lennox, W. G.: *New Light on Epilepsy and Migraine*, New York, Harper Brothers, 1941.

Incidentally, the correspondent is giving too small a dose of phenobarbital and there would seem to be no indication for the use of hormones.

WILLIAM G. LENNOX, M.D., Boston.

MERCUPURIN

To the Editor:—During the past six years each of us has administered a large number of doses of mercupurin to patients with congestive heart failure without any serious toxic reactions. Therefore we were startled on learning that we had independently within the last two months observed three deaths following an intravenous injection of the drug. On further inquiry we found that others of our acquaintance had recently observed extremely serious and even fatal reactions following promptly after the injection of mercupurin. Since the technic had been the same as that used by us in giving several thousand injections of mercupurin, we are at a loss for an adequate explanation of these recent reactions. Tyson (THE JOURNAL, September 20, p. 998) reported dangerous reactions after the injection of mercurials in cases of nephrosis; none of the fatal or nonfatal reactions noted by us occurred in patients with this malady.

Since no postmortem examination was made, we will not attempt to give complete reports of the cases. Briefly, the patients all suffered from congestive heart failure, one of syphilitic, another of hypertensive and the last of arteriosclerotic origin. All had received mercupurin previously. The last dose in each case was 2 cc. The drug was given slowly by vein. Death in each case was immediate.

If more such deaths have been occurring recently it would be well to have the subject of mercurials reexamined. It is for this reason that we are bringing our experiences to your attention at this time. We suggest that until further investigation mercupurin be given intramuscularly. The diuresis following intramuscular injection is usually satisfactory.

LOUIS FRIEDFELD, M.D.

MILTON KISSIN, M.D.

WALTER MODELL, M.D.

RALPH SUSSMAN, M.D.

New York.

BILATERAL THROMBOSIS OF ANTERIOR CEREBRAL ARTERY

To the Editor:—In THE JOURNAL, September 27, Judah Marmor and M. R. Sapirstein reported a case of "Bilateral Thrombosis of Anterior Cerebral Artery Following Stimulation of a Hyperactive Carotid Sinus."

The authors gave the blood count of this patient as hemoglobin 114 per cent, red cells 6,100,000 and leukocytes 14,000 with a normal differential. The hematocrit test, however, was within normal limits.

They conclude that "the slowing of the pulse and the fall in blood pressure produced by stimulation of the carotid sinus was a contributory factor in prematurely precipitating the cerebral thrombosis . . . in elderly persons with evidence of advanced arteriosclerosis, cerebral as well as myocardial. It may well be that carotid sinus stimulation is not entirely without danger in such persons."

While their conclusion is logical, I think that they should also have stressed the probability of the polycythemia, although not vera, having been a predisposing factor for the thrombosis in this case. It would seem advisable then that in elderly patients with polycythemia stimulation of the carotid sinus should be performed with caution.

L. FELDMAN, M.D., Chicago.

NOTE.—This letter was referred to the authors, who reply:

To the Editor:—In the writing of our report Dr. Sapirstein and I had seriously weighed the question of whether or not the polycythemia had been a significant predisposing factor for the thrombosis and after thorough consideration had come to the conclusion that it had not. Our opinion was based chiefly on the fact that the hematocrit test was within normal limits, which is not the case in true polycythemia. This seemed to indicate that we were dealing merely with a high normal blood count of no particular pathogenic significance, and we concluded, therefore, that the advanced cerebral arteriosclerosis was the important predisposing factor in our case.

Nevertheless, we would agree that the statement expressed by your correspondent is a valid one, namely that "in elderly persons with polycythemia, carotid sinus stimulation should be performed with caution." We would carry the concept even further, however, and state that in any person in whom there is a predisposition to thrombus formation, for whatever reason, carotid sinus stimulation should be performed with caution.

JUDAH MARMOR, M.D., New York.

OXYGEN TENT THERAPY IN THE TREATMENT OF ECLAMPSIA

To the Editor:—Under the title "Oxygen Tent Therapy in the Treatment of Eclampsia" Dr. Roy E. Nicodemus published his impression that continuous oxygen therapy, combined with the Stroganoff treatment, played a major part in the recovery of a number of his patients with eclampsia. He states that in a careful perusal of the literature on the treatment of eclampsia he could find no reference to the use of oxygen other than the early writings of Stroganoff and De Lee on oxygen inhalations instituted immediately after convulsive seizures (THE JOURNAL, October 11, p. 1238). This rediscovery of oxygen as an important adjunct in the treatment of eclampsia is fascinating. A good thing bears repeating. In 1912 investigation concerning certain chemical aspects of autolysis of the liver revealed that the administration of oxygen significantly retarded this phenomenon. It was this observation that served as an impetus to incorporate oxygen administration as a routine in the treatment of eclampsia and severe preeclampsia in which acute degeneration of the liver so frequently occurs (Hofbauer, J. I.: *Jahresk. f. ärztl. Fortbild.* 7:22, 1912). By the same token the administration of chloroform to eclamptic patients, because of its hepatotoxic effect, was strongly deprecated. This view was further elaborated in an address entitled "Recent Advances in the Treatment of Eclampsia Gravidarum." In a survey of certain concrete conditions concerning anoxemia incident to the disorder, it was emphasized that "inhibition of the oxidative processes in eclamptics affords a biochemical basis for the institution of a liberal administration of oxygen to such patients, as recommended by us years ago" (*Am. J. Obst. & Gynec.* 26:311 [Sept.] 1933).

For the rational treatment of preeclampsia and eclampsia a full understanding of the causation and nature of the disorder is the prime prerequisite. Conquest of the etiology of eclampsia has for decades been regarded the supreme task and achievement in obstetrics. Today it is acknowledged that heretofore the magnificent efforts to unravel the problem have resulted in

confessed futility. Recent unavailing attempts to revive the long discredited theory of anaphylaxis or the "pressure theory" signify the present chaotic state of reasoning and confusion as to the pathogenesis and etiology of the toxemia of pregnancy. The jungle of theories will not be cleared until the fundamental facts are mastered.

Using facts, not theories, a forthcoming paper (*West. J. Surg., Gynec. & Obst.*, November 1941) makes an outright bid for arrival at the threshold of certain fundamentals of the etiology of preeclampsia. In accord with Irving, Soma Weiss and others who placed stress on functional disturbances of the arterioles and capillaries as probably holding the key to much of the mystery, the signs and symptoms of "this vascular syndrome of pregnancy" (Weiss) as well as the multiple bodily changes occurring in the disorder are there interpreted in terms of deranged vascular physiology, which pivots on the interaction of three pharmacologically well defined principles—histamine, pitressin, acetylcholine—during gestation. While pitressin and acetylcholine are normal constituents of pregnancy, the first named occurs only in toxemia. This study serves to bring to a realization and conclusion, for the time being, previous investigations quoted in the text. Deviation from current thought is particularly apparent in my consideration of biologic placental insufficiency—reflected anatomically in the well known occurrence of multiple infarcts, hemorrhage and areas of autolysis in the toxemic placenta which reduce its ability to store acetylcholine, estrin and progesterone—as a determining etiologic factor in preeclampsia. This is at sharp variance with the view generally held that certain hitherto undefined products of placental decomposition constitute a basic essential in the pathogenesis of the late toxemia. The attempted coordination, in my paper, of the facts presented is too challenging to be passed over. If examined dispassionately and graciously received, the basic arguments advanced may serve to waive the doctrine that the etiology of the toxemia of pregnancy is utterly obscure. "Let there be light."

J. I. HOFBAUER, M.D., Cincinnati.

NUTRITION

To the Editor:—Dr. Philip R. Trommer (THE JOURNAL, October 11, p. 1283) will do well to check some of his own premises before impugning the opinion of Dr. Logan Clendening with whose timely comment as to the factual dearth of clinical hypovitaminoses I heartily agree. In the dermatologic section of the outpatient clinic from which Dr. Clendening's patients also were drawn, I see extremely little evidence of pellagra, although a dermatologic eye at least intends to be acute to such symptoms. A diet of "6 to 8 cups of coffee a day together with 2 to 3 packs of cigarets" is, incidentally, quite a reliable symptom of hypothyroidism, which is more likely to be the basic cause of "anorexia and loss of weight" than the patient's selection of ingesta. Hypothyroidism is also a cause, frequently enough, of malmetabolism of vitamins, especially of vitamin A. Perhaps with a normal complement of thyroxin some persons would not stay on relief.

RICHARD L. SUTTON JR., M.D., Kansas City, Mo.

RAT BITE FEVER

To the Editor:—In perusing THE JOURNAL of May 24, page 2393, I saw the report of Dr. John Greenwood and Dr. Edmond R. Hess of rat bite fever in an infant aged 11 days. I was once awakened from my sleep within three hours after an infant was born by its crying; I saw a rat biting the child's toe. Following this rat bite the child had rat bite fever.

G. A. BYERS, M.D., North Bend, Neb.

Rhode Island October Report

The Rhode Island Board of Examiners in Medicine reports the written examination for medical licensure held at Providence, Oct. 2-3, 1941. The examination covered 9 subjects and included 82 questions. An average of 80 per cent was required to pass. Three candidates were examined, all of whom passed. Three physicians were licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Loyola University School of Medicine.....	(1933)		1
Tufts College Medical School.....	(1940)		1
Jefferson Medical College of Philadelphia.....	(1939)		1
School	LICENSED BY ENDORSEMENT	Year Grad.	
Boston University School of Medicine.....	(1936)		
Harvard Medical School.....	(1938)		
Tufts College Medical School.....	(1939)		

Kansas September Report

The Kansas State Board of Medical Registration and Examination reports the written examination for medical licensure held at Kansas City, Sept. 23-24, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Fourteen candidates were examined, all of whom passed. Nine physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
University of Kansas School of Medicine.....	(1941, 12)		12
St. Louis University School of Medicine.....	(1940)		1
University of Tennessee College of Medicine.....	(1941)		1
School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Northwestern University Medical School.....	(1922)		Illinois
University of Louisville School of Medicine.....	(1931), (1940)		Kentucky
Tulane University of Louisiana School of Medicine.....	(1935)		Louisiana
University of Michigan Medical School.....	(1935)		Michigan
Creighton University School of Medicine.....	(1939)		California
University of Cincinnati College of Medicine.....	(1940)		Ohio
University of Tennessee College of Medicine.....	(1927)		Tennessee
McGill University Faculty of Medicine.....	(1933)		California

Tennessee June Report

The Tennessee State Board of Medical Examiners reports the written examination for medical licensure held at Knoxville, Memphis and Nashville, June 16-17, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and thirty-eight candidates were examined, 137 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
George Washington University School of Medicine.....	(1939)		1
Howard University College of Medicine.....			2
Jefferson Medical College of Philadelphia.....			1
University of Pennsylvania School of Medicine.....			1
Meharry Medical College.....	(1940), (1941, 47)		48
Univ. of Tennessee College of Medicine.....	(1940, 2), (1941, 30)		32
Vanderbilt University School of Medicine.....	(1941, 52)		52
School	FAILED	Year Grad.	
University of Tennessee College of Medicine.....	(1941)		

Eighteen physicians were licensed to practice medicine by endorsement from June 5 through August 21. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Alabama School of Medicine.....			Arkansas
College of Physicians and Surgeons.....			B. M. Ex.
University of Chicago.....			Georgia
Johns Hopkins University School of Medicine.....	(1934)		Maryland
University of Michigan Medical School.....	(1936)		Michigan
Wayne University College of Medicine.....	(1940)		Michigan
Washington University School of Medicine.....	(1939)		Missouri
New York Medical College, Flower and Fifth Avenue Hospitals.....	(1939)		N.B. M. Ex.
Duke University School of Medicine.....			N. B. M. Ex.
Western Reserve University.....			Ohio
University of Oklahoma School of Medicine.....			Oklahoma
Jefferson Medical College of Philadelphia.....	(1924)		S. Carolina,
(1938) Pennsylvania.....			Indiana
University of Pennsylvania School of Medicine.....	(1900)		
(1938) New York.....			
Medical College of the State of South Carolina.....	(1939)		S. Carolina
University of Tennessee College of Medicine.....	(1931)		W. Virginia
Medical College of Virginia.....	(1903)		Virginia

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: "Conceded Eminence and Authority" in the Profession as Basis for Licensure Without Examination.—Marburg was licensed to practice medicine in Austria in 1899 and practiced there until 1938, becoming, in the words of some American physicians who certified as to his eminence when he sought a license to practice in New York, "the leading neuropathologist in Europe." In 1938 he immigrated to the United States and subsequently filed a declaration of intention to become a citizen. He was appointed clinical professor of neurology at Columbia University College of Physicians and Surgeons and research neuropathologist at Montefiore Hospital, New York City. He sought a license to practice medicine in New York State without examination by virtue of section 1259 of the Education Law, which authorizes the commissioner of education in his discretion on the approval of the board of regents, in effect, to license without examination a physician licensed by another state, or country, provided the applicant possesses the preliminary and professional qualifications required of an applicant for licensure after examination, has been in reputable practice for ten years or more and has reached a position of conceded eminence and authority in his profession. The commissioner and the board of regents denied the application and Marburg instituted a proceeding to require the approval of his application. The trial court entered such an order and the order was affirmed on appeal by the supreme court, appellate division, third department, New York. (*Marburg v. Cole*, 23 N. Y. S. [2d] 501). The commissioner and the board then appealed to the Court of Appeals of New York.

The sole question presented for the determination of the Court of Appeals was whether or not the refusal to grant Marburg's application was so arbitrary, capricious or unreasonable as to constitute an abuse of the discretion conferred on the commissioner and the board by section 1259 of the Education Law, referred to. That statute, said the Court of Appeals, expressly invests the commissioner of education and the board of regents with a wide discretion, the due exercise of which the courts do not have the power to disturb. Nor do the courts have the power to substitute their judgment for the judgment of the properly delegated administrative officials. Thus in the absence of clear and convincing proof that the discretion has been exercised arbitrarily, unfairly or capriciously, the courts will not interfere. The commissioner and the board have exercised with great caution the broad discretion conferred on them by section 1259 to license eminent men, licensing only four persons under this section since it was enacted in 1918. Each person so singularly honored had attained prior to such licensure a position of eminence and authority in the medical profession. One of the physicians so honored had discovered the Schick test for determining susceptibility to diphtheria. Another physician had been the recipient in 1934 of the Nobel prize in medicine and was the co-discoverer of the cause and cure for pernicious anemia. Another physician had been the originator of the so-called insulin shock treatment for dementia precox or schizophrenia. The fourth physician so licensed had previously been a full professor of gynecology and obstetrics at the University of Toronto Faculty of Medicine and had been called to a full professorship of gynecology and obstetrics by the Columbia University College of Physicians and Surgeons and to the directorship of the Sloane Hospital for Women. Apparently, the board in exercising its broad discretion in determining what constituted "a position of conceded eminence and authority" in the profession had adopted a rigid objective test that the eminence required by the statute is obtained only by an outstanding original contribution in some one field of medicine. They departed from this objective standard in permitting the licensure of the last physician referred to, but in view of his appointments the board concluded that they could, within their discretion, make such an exception since they were satisfied that that physician ranked among the few outstanding men in his profession as evidenced by universal recognition and outstanding appointments in New York State. In the case at

bar, said the Court of Appeals, after full hearings the commissioner and the board have come to the determination that the eminence of Dr. Marburg does not satisfy the standard required by the statute as it has been interpreted by them in the past. It is this determination that the Court is asked to declare to be arbitrary, unfair and capricious, but the Court does not believe that such is the case. It is not claimed by Marburg, nor does the record show, that he is responsible for any outstanding original contribution to any field of medicine. Thus if the eminence of Marburg is in any way to satisfy the high degree of eminence which has been set as the prerequisite for the indorsement of a medical license under this section it must be shown that his eminence in the field of neurology is so great that it can be said to be arbitrary, unfair or capricious for the commissioner and the board to have refused to make an exception to the general standard in his case. While the evidence with respect to Marburg's reputation and his accomplishments is impressive, it did not, in the opinion of the Court, require the board and the commissioner to make an exception to their general standard in Marburg's case nor as a matter of law render their refusal to do so arbitrary, unfair or capricious.

Marburg did not allege, nor was there any evidence to support a claim, that the standard which had been adopted by the commissioner and by the board with respect to license by virtue of section 1259 was arbitrary or unreasonable. The law, said the Court, is well settled that it is not always necessary that license legislation prescribe a specific rule of action. Where it is difficult or impracticable for the legislature to lay down a definite, comprehensive rule, a reasonable amount of discretion may be delegated to the administrative officials. Where the administrative agency has adopted a standard as an interpretation of the broad powers granted to it by the statute, the Court may declare such a standard invalid only in the event that it is so lacking in reason for its promulgation that it is essentially arbitrary. In concluding that the interpretation adopted by the commissioner and the board of the powers confided to them by the legislature through the provisions of the section in question is not unreasonable, the Court adverted to the liberality accorded by New York State to practitioners of other states who have been licensed in the past by virtue of other sections of the medical practice act. The Court quoted figures as to the number of such applicants who have been granted licenses in New York, from which it appeared that of the 1,054 graduates of foreign medical schools admitted to practice medicine in New York after examination in 1939 and 1940, the vast majority were persons who were born in foreign countries and came to this country during the last several years. Thus in the case at bar, where the board of regents has interpreted the words "conceded eminence and authority in his profession" to mean an outstanding original contribution to a certain field of medicine or standing among the first few men of his profession, as evidenced by universal recognition and outstanding appointments to positions of high responsibility in the state, such interpretation cannot be said as a matter of law to be unreasonable or arbitrary.

Since success in this proceeding required the petitioner to establish a clear legal right to the remedy he chose and since it appeared that the power granted to the commissioner and to the board under section 1259 is more a power to confer a privilege and does not create an absolute right in an applicant, no order to compel the exercise of the power will lie except where the refusal is arbitrary, unfair or capricious. There being no evidence to sustain such a finding, the Court reversed the action of the court below requiring the issuance of a license to Marburg.—*Marburg v. Cole*, 36 N. E. (2d) 113 (N. Y., 1941).

Optometry Practice Acts: Illegality of Activities of Licensed Physician Employed by Jewelry Store to Practice Optometry.—Gilmore, who was licensed to practice neither medicine nor optometry, operated a jewelry store and in connection therewith maintained an optical department in which refraction was done by Sidel, apparently a licensed optometrist, and by Bertrem, a licensed physician, both of whom were employed by Gilmore on a straight salary basis. The Florida State Board of Optometry instituted proceedings to enjoin Gilmore, Sidel and Bertrem from practicing optometry. The trial court restrained Gilmore from continuing to employ Sidel for the practice of optometry but refused to restrain

Gilmore himself from practicing or from continuing to employ Bertrem, the licensed physician, to practice. The board then appealed to the Supreme Court of Florida.

Section 11 of the Florida optometry practice act (Laws of Florida, Acts of 1939, chapter 19031) makes it "unlawful for any corporation, lay body, organization, group, or lay individual to engage, or undertake to engage in, the practice of Optometry through means of engaging the services, upon a salary, commission, or lease basis, or by other means or inducement, any person licensed to practice Optometry in the State of Florida." Section 8 of this same act makes it unlawful for any person to practice optometry in the state without first procuring a certificate of registration and license but provides that "the terms and provisions of this Act shall not apply to duly licensed physicians and surgeons." The jeweler and the physician on appeal argued that the action of the trial court was proper because, while section 11 expressly prohibits an unlicensed person from practicing optometry through a person licensed to practice optometry, section 8 frees all physicians from the restrictions imposed generally on those who are privileged to represent themselves as optometrists. The Supreme Court, however, would not so construe the act. The provision, said the Court, that the act should not apply to duly licensed physicians and surgeons is included in the section making it unlawful to practice without registration and license. It is patent that physicians are exempt from the provisions of the optometry practice act because their training is so thorough that they are fitted to perform those services for which optometrists are also qualified. Thus, a physician, as such, is not required to procure a certificate of registration and license as a registered optometrist to practice optometry lawfully. If a physician practices optometry on his own account and responsibility he is by schooling presumed properly equipped and there is no need to examine into his fitness, the diagnoses and prescriptions for correction and relief of the human eye being an incident to and included in his medical education. But when a physician steps out of character and becomes the employee of a person himself not entitled to engage in the practice of optometry a direct violation of section 11, quoted above, results. The provision of the act of which the jeweler has run afoul denounces the employment on a salary basis of "any person licensed to practice Optometry." Here qualifications are not the criterion but the act condemned by the legislature is the hiring by one unlearned in the profession of another who is permitted by his knowledge to engage in it. The evil sought to be prevented by such a relationship may be tersely stated. In this situation the responsibility of the employee in the performance of services important to those whose eyes are abnormal is confused with his loyalty to the employer, while the latter, although unskilled in the work, is accountable to patients to whom he is not personally permitted to minister. The result is a broken relationship between a professional man and those who engage his services.

The court concluded, therefore, that the optometry practice act prohibits the practice of optometry under the circumstances here present and accordingly reversed the decree of the trial court refusing to enjoin Gilmore and Bertrem, the licensed physician, from engaging in the practice of optometry.—*State Board of Optometry v. Gilmore*, 3 So. (2d) 708 (Fla., 1941).

Society Proceedings

COMING MEETINGS

- American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Diveley, 1103 Grand Ave., Kansas City, Mo., Secretary.
- National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
- Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. García, P. O. Box 3866, Santurce, Secretary.
- Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Surgical Association, Pinchurst, N. C., Dec. 9-11. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Obstetrics and Gynecology, St. Louis

42:373-556 (Sept.) 1941. Partial Index

- Obstetric Responsibility for Prevention of Fetal Deaths A H Aldridge and R S Meredith New York—p 373
- *Common Etiology of Erythroblastosis and Transfusion Accidents in Pregnancy L Burnham, Englewood, N J—p 389
- Parenteral Vitamin K Therapy in Antepartum Women and Its Effects on Infant's Prothrombin Levels Preliminary Report R L McCready, E T Callahan and D J Grundin, New York—p 398
- Vitamin A in Pregnancy II Comparison of Dark Adaptation and Serum Tests J C Hirst and R E Shoemaker, Philadelphia—p 404
- *Prothrombin Concentration and Mineral Oil C T Javert and C Macri, New York—p 409
- Prothrombin Concentration in Normal Pregnancy C T Javert and C Macri, New York—p 415
- *Placental Blood Plasma R M Curtis and R W Worthington Jr., Baltimore—p 428
- Role of Cesarean Section in Toxemias of Pregnancy H A Strauss and Leah Fisher, Chicago—p 440
- Eleven Year Survey of Cesarean Section at a Small Community Hospital W T Liccione, Mount Vernon N Y—p 446
- Shortening of Labor with Syntropan J E Stoll, Chicago—p 473
- Some Etiologic Factors in Sterility Study of 483 Patients Admitted to the Sterility Clinic, Bellevue Hospital Virginia Clay Hamilton, Bath, Maine—p 477
- Hormone Management of Nausea and Vomiting of Early Pregnancy S Shute London, Ont., Canada—p 490
- A Twenty Four Hour Pregnancy Test R T Frank and Rose L Bernin, New York—p 492
- Studies in Viability of Human Spermatozoa Preliminary Report M D Klein and M Siroka New York—p 497
- Menorrhagia as Primary Factor in Various Blood Dyscrasias C L Buxton, New York—p 502
- Effect of Intramuscular Injections of Whole Blood on Prothrombin Index of Newborn Infant S S Gellis and R A Lyon, Cincinnati—p 519
- Inhibition of Lactation with Stilbestrol E B Mendel, A M Goldman and A Caire Jr., New Orleans—p 528
- Röntgenologic Sign for Detection of Placenta Previa R P Bill and R Golden, New York—p 530

Erythroblastosis and Transfusion Accidents.—Burnham calls attention to the common etiology of two apparently unrelated conditions, erythroblastosis fetalis and certain transfusion accidents occurring in pregnancy. The etiology of erythroblastosis fetalis resides in an immunologic incompatibility between the fetus and the mother, that is, there is present in the fetal erythrocytes an antigen inherited from the father which is lacking in the mother. The antigen diffuses from the child into the mother's circulation and stimulates the formation of destructive antibodies. These antibodies readily diffuse into the fetal circulation, where they can attack the erythrocytes which contain the antigen and thereby cause erythroblastosis. Should such a mother be given a transfusion containing the antigen, the destructive antibodies (agglutinins) in her circulation would agglutinate and hemolyze the transfused blood causing the frequently fatal oliguria or anuria. These reactions occur between bloods of the same group and in spite of apparently compatible cross matching. Stated in another way, when a rhesus monkey antigen negative woman is carrying an Rh (rhesus) positive baby, sometimes the baby's blood stimulates the mother to form the anti-Rh agglutinin. This antibody, in turn, passes back through the placenta and destroys the baby's Rh positive blood and causes erythroblastosis. Should the mother be transfused with Rh positive blood, the agglutinin can agglutinate and destroy the transfused blood and its hemoglobin blocks the kidneys and causes oliguria or anuria. Should a mother of a possible erythroblastosis baby require a transfusion, it is safer to determine her Rh status and to use a corresponding donor, usually an Rh negative donor. Should no precautionary measures be available in suspicious cases it is safer to use blood

substitutes, preferably blood plasma. The erythroblastosis group must be broadened to include not only hydrops fetalis, icterus gravis and congenital anemia but some of the macerated fetuses not due to syphilis, diabetes or toxemia and also many, if not most, of the anemias of the newborn. Some cases of miscarriage may likewise belong in this group.

Prothrombin Concentration and Liquid Petrolatum.—Javert and Macri point out that the intermittent or regular use of liquid petrolatum (mineral oil) has been observed to reduce and to maintain the reduction of the prothrombin concentration in pregnancy. Its intermittent use reduced the prothrombin levels in 3 of 9 patients, while daily intake for longer than one or two weeks resulted in a lowered prothrombin in 7 of 10 patients. Apparently the oil interferes with the absorption of vitamin K or it may inhibit bacterial synthesis in the intestine. The oil may even accumulate in the hepatic cells. The evidence at hand suggests that the oral administration of vitamin K to pregnant women may prove of little or no value unless the simultaneous use of liquid petrolatum is curtailed.

Placental Blood Plasma.—Curtis and Worthington state that sterile plasma can be obtained from placental blood in worthwhile quantities. They obtained an average of 103 cc of whole blood from 280 placentas. From 128 cc of citrated placental blood they obtained an average of 70 cc of consistently uncontaminated citrated plasma (25 cc of 2.5 per cent sodium citrate solution being placed in each collecting bottle). The blood is taken from the cord immediately after delivery, prior to the expulsion of the placenta and before any perineal repair is made. The cord is clamped and cut 2 inches (48 cm) from the umbilicus. The collecting flask and cord are wrapped in a sterile towel and held by an assistant, thus preventing any contamination by amniotic fluid. The cord is milked to express the blood while pressure is made on the uterus to fill the cord with the blood which remains in the placenta. A test for syphilis is made on the collected blood. Blood has not been taken from patients whose membranes have been ruptured for forty-eight or more hours or from those with any evidence of a disease transmittable by the mother to the fetus. The authors have used placental plasma in varied clinical conditions. The clinical response shown has been gratifying and there were no local or systemic reactions following its administration. Some of the clinical conditions were hypoproteinemia, acute glomerulonephritis, infections with associated dehydration and shock due to a variety of causes. The authors constructed an inexpensive but satisfactory dehydration apparatus and are dehydrating pooled placental plasma obtained from the obstetric service of another hospital. They feel that during a national emergency placental blood from several hospitals could be transported to central depots for plasma preparation and storage. If their preliminary experiments are substantiated, dried placental plasma used locally to stimulate cell growth may offer a definite advance in the treatment of wounds.

Arkansas Medical Society Journal, Fort Smith

38:79-98 (Sept.) 1941

- Sinus Disease Is Curable When Correctly Diagnosed and Properly Treated V L Payne, Pine Bluff—p 79
- Significance of Cough as Symptom O C Nelson, Little Rock—p 82

Journal of Allergy, St. Louis

12:327-424 (May) 1941

- Studies on Blood Histamine in Cases of Allergy I Blood Histamine During Wheel Formation B Rose, Montreal, Canada—p 327
- Histamine in Allergy Study of Its Effects on Skin Reactivity to Histamine and to Allergens H Miller, R C Hawes and G Pincus, Los Angeles—p 335
- Influence of Histamine on Course of Anaphylaxis and Histamine Shock in Guinea Pigs O W Barlow and E Homberger, Rensselaer, N Y—p 346
- Action of Histamine on Histamine Content of Blood of Rabbit R Williams, H L Alexander and T Kircher, St. Louis—p 359
- Slowly Absorbed Gelatin Pollen Extract for Treatment of Hay Fever W C Spain, A M Fuchs and Margaret B Strauss, New York—p 365
- Treatment of Hay Fever by Injections of Suspended Pollen Tannate H L Nutterman, Boston—p 378
- Study of Clinical Sensitivity to Air Borne Molds Edna S Pennington, Nashville, Tenn—p 383

Journal of Nervous and Mental Disease, New York

93:701-836 (June) 1941

- Bilateral Fracture of Femoral Necks Caused by Metrazol Induced Convulsions. S. Androp, Catonsville, Md.—p. 701.
- Posthospital Adaptation of Selected Group of Patients with Dementia Praecox. J. L. Hoffman, E. H. Parsons and Margaret W. Hagan, Washington, D. C.—p. 705.
- Esophageal Spasm: Observation of Emotional Influences by Means of Esophagoscope: Report of Case. W. B. Faulkner Jr., San Francisco.—p. 713.
- Color Blindness and Tone Deafness Restored to Health During Psychotherapeutic Treatment Using Dream Analysis. K. R. Stewart, Mamaroneck, N. Y.—p. 716.
- Protrusion of Two Intervertebral Disks in Cervical Region: Report of Case. T. T. Stone, A. J. Arieff, L. Kaplan and C. Brown, Chicago.—p. 719.
- Paramyoclonus Multiplex of Friedreich: Report of Case with Symptomatic Recovery Three Days After Onset. E. S. Brewster, Boone, Iowa.—p. 723.
- Physiosocial Basis of Mental Disorder. G. W. Kisker and G. W. Knox, Columbus, Ohio.—p. 731.
- Allergy and Nervous Diseases. N. W. Winkelman and M. T. Moore, Philadelphia.—p. 736.
- Permeability Changes in Brain Induced by Metrazol and Insulin Convulsions. E. A. Spiegel and Mona Spiegel-Adolf, Philadelphia.—p. 750.

94:1-132 (July) 1941

- Paralyzing Effect of Fright. E. F. Reaser, Huntington, W. Va.—p. 1.
- Insulin Hypoglycemia and Electrocardiogram. B. E. Goodrich and F. J. Smith, Detroit.—p. 10.
- The Chronic Alcoholic as a Neurotic and a Dreamer. B. Karpman, Washington, D. C.—p. 17.
- Innervation of Limbs. J. A. Abbott and M. Moore, Boston.—p. 41.
- Hypnotic Suggestion: Its Dynamics, Indications and Limitations in Therapy of Neurosis. S. Lorand, New York.—p. 64.
- Psychopathologic Disorders in the Mother. Mabel Huschka, New York.—p. 76.

New York State Journal of Medicine, New York

41:1795-1890 (Sept. 15) 1941

- Cerebral Palsy Problem. L. C. Duryea, New York.—p. 1819.
- Neurologic Aspects of Spasticity and Athetosis. T. J. Putnam, New York.—p. 1822.
- Differential Characteristics of Spasticity and Athetosis in Relation to Therapeutic Measures. W. M. Phelps, Baltimore.—p. 1827.
- Treatment of the Hypochondriac. R. B. McGraw and Z. Piotrowski, New York.—p. 1833.
- Therapeutic Relaxation. H. J. Behrend and J. Weiss, New York.—p. 1838.
- *Pulmonary Embolism—Diagnosis. J. M. Freston, New York.—p. 1843.
- Popular Education as Factor in Solution of Cancer Problem. J. M. Swan, Rochester.—p. 1849.
- Roseola Infantum (Exanthem Subitum). B. B. Breese Jr., Rochester.—p. 1854.
- *Acute Bacterial Endarteritis of Patent Ductus Arteriosus. W. T. Gibb Jr., New York.—p. 1861.

Pulmonary Embolism.—Freston reports the 5 cases of pulmonary embolism encountered at the Roosevelt Hospital within one year; 4 were confirmed at necropsy and 1 patient recovered. A clinical diagnosis was made in only 1 of the 5 cases. Of the 5 patients, 4 were between 50 and 55; the fifth was 37. Only 1 was a woman. Two had had symptoms referable to the cardiovascular system for two and five years; auricular fibrillation was present on admission in the latter patient. The onset was sudden in 3 and less dramatic in 2. The chief complaint at onset was sharp axillary chest pain in 2, precordial burning pain with accompanying knifelike stabbing pain in 1, substernal fulness in 1 and sharp abdominal pain in 1. Dyspnea was present in all on or before admission. Faintness or actual fainting had occurred in 3, localized pain in the lower extremities in 1, hemoptysis in 1, mental symptoms in 1 and maniacal episodes in 2. The physical signs on admission included dyspnea, tachycardia, fever, leukocytosis and cyanosis in all, and polycythemia in 1. Dulness or rales were present in 3; fluid was present in 2 of these. The blood pressure was depressed in 2 and could not be obtained in 1 whose symptoms occurred an hour and a half before admission and in whom a tender popliteal mass led to the one correct diagnosis. In the others shock or phlebothrombosis was absent. Pulmonary embolism, a disease of recurrent multiple embolizations, offers an opportunity to attempt therapy. Efficacious therapy will depend on an accurate diagnosis of the original condition contributing to embolization. Electrocardiographic changes diagnostic of pulmonary embolism were present in 3 of the patients, and 2 had single electrocardiograms that were not diagnostic. Characteristic electrocardiographic changes depend on cor pul-

monale—on metabolic changes in the right and possibly the left ventricle. If clinical collapse does not occur, the electrocardiogram will probably be normal. Conditions that produce right ventricular strain, mitral disease, pulmonary emphysema and so on produce similar electrocardiographic changes and must be ruled out. The temporary and shifting electrocardiographic changes are probably the most significant diagnostic features. The roentgen diagnosis of pulmonary infarction also presents its problems. Confusion is produced by the presence of fluid and of pulmonary congestion, either of which masks the roentgen signs. However, pulmonary embolization with or without infarction is a fairly common condition, often unrecognized when the primary venous thrombosis is not obvious. Thrombosis of the popliteal veins—unilateral in 3 and bilateral in 1—was found at the necropsy of the 4 patients who died. Edema was either absent or slight or it was considered due to the primary cardiac condition.

Endarteritis of Patent Ductus Arteriosus.—Gibb reports an instance of a person who had had an uncomplicated patent ductus arteriosus for fifty years before an acute bacterial endarteritis that had involved the pulmonary artery in the region of the ductus and had extended into the ductus itself and a small part of the aorta superimposed itself. The cardiac valves were free of any bacterial involvement. They showed no evidence of any other disease process except some thickening due to tension and arteriosclerosis. No primary source for this infection other than an extensive bronchial inflammation was found at necropsy. The explanation is that a transient bacteremia arose from such a source and produced the acute endarteritis. Involvement of the pulmonary artery was apparently responsible for the pulmonary infarcts, and probably the extension of the bacterial lesion into the aorta and the associated phlebitis of the pulmonary vein led to the systemic involvement. During the acute disease, a cardiac murmur was not audible. The explanation for this discrepancy was apparent at necropsy in that the entire lumen of the ductus was occluded by vegetations, and it was assumed that but little blood passed through this arteriovenous shunt. Dilatation of the pulmonary artery and pulmonary conus offers evidence for the belief that the ductus arteriosus was patent for some time prior to the endarterial infection. This was further suggested by hypertrophy and dilatation of the right cardiac chambers, indicating the long-standing anomalous shunting of blood. Aside from the usual contraindications to any extensive surgical procedure, the real difficulty in ligation of uncomplicated patent ductus arteriosus lies not so much in the accurate diagnosis of the lesion or in the determination of the optimal time for operation but, rather, in persuading parents to have an apparently healthy young person subjected to an operative procedure with a mortality incidence of at least 10 per cent.

Philippine Medical Association Journal, Manila

21:331-378 (July) 1941

- Ascaris Lumbricoides in Common Bile Duct: Report of Case. J. Estrada and E. Garcia, Manila.—p. 331.
- Role of X-Ray in Diagnosis of Acute Abdominal Conditions. P. S. Chikiamco and J. L. Torres, Manila.—p. 337.
- Sulfathiazole in Certain Acute Infections: Preliminary Report. C. Mata, San Juan del Monte.—p. 341.
- The Expert Witness. G. T. Lantin, Manila.—p. 347.

Wisconsin Medical Journal, Madison

40:653-772 (Aug.) 1941

- Extra-Abdominal Diseases That May Cause Abdominal Symptoms: I. Repercussions of Personality Disorders. E. G. Billings, Denver.—p. 667.
- Id.: II. Cardiac and Pulmonary Diseases. A. R. Elliott, Chicago.—p. 672.
- Id.: III. Allergic, Hematologic, Endocrine, Deficiency and Infectious Diseases. F. W. Madison, Milwaukee.—p. 676.
- Practical Value of Gonioscopy for Understanding, Diagnosis and Treatment of Glaucoma. P. C. Kronfeld, Chicago.—p. 681.

40:773-880 (Sept.) 1941

- Management of Infantile Allergic Eczema. G. M. Cline, Bloomington, Ill.—p. 789.
- Emotional Factors in Allergic Eczema. T. L. Squire, Milwaukee.—p. 793.
- Oil Bases in Estrogenic Substances as Cause of Allergic Dermatitis: Report of Case. L. S. Markson and C. M. Schoen, Milwaukee.—p. 796.
- Molds as Cause of Seasonal Allergy: Spore Count of Milwaukee. B. B. Schoenkerman, Milwaukee.—p. 797.
- Vertigo. W. E. Grove, Milwaukee.—p. 799.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:255-292 (Aug. 23) 1941

- *Amebic Dysentery and Its Effective Treatment: Critical Study of 535 Cases. P. Manson-Bahr.—p. 255.
- Amebiasis—Pulmonary Complications. B. A. Dormer and J. Friedlander.—p. 258.
- Surgical Complications of Amebic Dysentery. H. W. S. Wright.—p. 261.
- Cysticercosis Epilepsy. C. W. Ewing.—p. 263.
- Massive Adrenal Carcinoma with Pseudohermaphroditism. M. Albert.—p. 265.

Treatment of Amebic Dysentery.—Manson-Bahr reviewed the records of 535 cases in which *Endameba histolytica* or its cysts were demonstrated by personal observation. Metastatic complications were not considered unless they were accompanied by manifestations of active amebic dysentery. Of the 535 patients, 259 had at some previous time received emetine injections alone or combined with other drugs. The results do not support the assumption that hypodermic injections of emetine are a certain cure. Such treatment controls the urgent clinical manifestations but does not, in the majority of instances, eradicate the infection. Evidence indicates that, far from curing the patient, the practice tends to render the amebas emetine fast and makes final cure more difficult. There were 7 emetine intoxications in the series. Twenty patients had relapses. Among 114 patients treated with emetine bismuth iodide in doses totaling 20 to 40 grains (1.3 to 2.6 Gm.) 7 (6.1 per cent) had relapses. Some proved singularly resistant, and 3 remained uncured after nine separate courses of the drug. Of 13 patients given emetine periodide in total doses from 2.6 to 4.6 Gm., 5 relapsed subsequently. Five patients were given auremetine (an aniline dye and emetine). The toxic effects were considerable, and all 5 patients had subsequent relapses. The results with quinoxyl (oxyquinoline sulfonic acid and iodine), given to 35 patients by mouth and rectum, led the author to believe that it is especially useful in infections resistant to emetine bismuth iodide but not in freshly occurring infections. Eight patients had subsequent relapses. The author believes that a combined treatment introduced by him and consisting of quinoxyl retention enema by day and emetine bismuth iodide by night is most efficacious. The treatment is continuous and is maintained for ten to twelve days. The relapse rate among 361 patients treated in this manner was 3.7 per cent. These refractory patients were eventually cured by further intensive treatments with emetine bismuth iodide and quinoxyl. Follow-up study for ten years and even longer has verified these results. With this treatment it is not necessary to restrict the diet. Seven of the 8 patients treated with acetarsone had subsequent relapses, and there were 5 instances of drug poisoning. Carbarsone proved no more effective than acetarsone, and there appears to be the same danger of arsenical poisoning. Relapses took place as soon as a course had been completed. No permanent cures were registered after the trial of several other drugs. It is evident that in treating chronic intestinal amebiasis the principle of antisepsis has to be maintained.

2:293-322 (Aug. 30) 1941

- Clinical Observations on Air Raid Casualties. R. T. Grant and E. B. Reeve.—p. 293.
- *Herpes Labialis After Sulfapyridine and T. A. B. Therapy. C. E. van Rooyen, A. J. Rhodes and A. C. Ewing.—p. 298.
- Puerperal Tetanus: Case. B. Maclean and P. Challen.—p. 302.
- Sandfly Fever and Benign Lymphocytic Meningitis. A. S. Pearson.—p. 303.
- Persistent Lactation with Note on Chiari and Frommel's Disease. B. Gilbert.—p. 305.

Herpes Labialis After Sulfapyridine and T. A. B.—According to van Rooyen and his associates, last winter they encountered 27 cases of herpes labialis among patients who had received a full course of sulfapyridine for gonorrhea and 6 cases among healthy nursing orderlies. The herpes developed after a provocative dose of T. A. B. vaccine. The clinical results of sulfapyridine therapy were excellent in that the urethral discharge had abated by the fifth day, so that on the sixth day patients

were given a 0.2 cc. dose of T. A. B. vaccine intravenously as a provocative test of cure. The first 24 of 25 patients who received this dose of vaccine had herpes labialis forty-eight hours later; 16 showed only a slight eruption which cleared up spontaneously without any treatment, but the lesions of the others were severe and a 50 per cent absolute alcohol dressing was applied with good effects. After this the dose of vaccine was reduced by half but again herpes developed in 3 of 6 persons. Thereafter hypertonic saline solution (instilled and retained in the urethra for a short time) was substituted as an alternative, and no further cases of herpes appeared. The conclusion reached was that if herpes labialis is to be avoided T. A. B. vaccine should not be given intravenously to persons immediately after a course of sulfapyridine therapy. This is particularly so during the winter months, when the herpes carrier rate is relatively high. The possibility that the batch of vaccine used became contaminated was explored, but animal inoculation and sterility tests proved that the product was faultless. Finally one of the authors was given 1 cc. of the vaccine subcutaneously without herpes developing. A high virus carrier rate can exist in a community without a high incidence of herpes labialis. In support of this the authors point out that during the winter months they encountered 6 cases of herpes arising spontaneously among healthy nursing orderlies and others in a unit of about 300. All the persons treated for gonorrhea probably carried the herpes virus in their saliva; the large doses of sulfapyridine did not destroy the herpes virus, nor did they cause herpes labialis but the sulfapyridine appeared greatly to enhance the herpetogenic effect of T. A. B. vaccine. The phenomenon was not due to leukopenia.

Lancet, London

2:271-300 (Sept. 6) 1941

- The Soldier's Defense and the Public's Attitude. W. C. M. Scott.—p. 271.
- *Renal Complications of Sulfapyridine Therapy. S. M. Laird.—p. 272.
- Bacteriology of Impetigo Contagiosa. R. Cruickshank.—p. 275.
- New Gastroscope with Controllable Flexibility. H. Taylor.—p. 276.
- Possible Case of Tick-Borne Typhus. G. B. Ludlam, I. R. C. Batchelor and A. J. Rhodes.—p. 278.
- Adrenalin-Ascorbate Suspensions in Bronchial Asthma. A. Kennedy.—p. 279.

Renal Complications of Sulfapyridine Therapy.—Laird reports the occurrence of hematuria in 5 soldiers being treated for gonorrhea with sulfapyridine. The clinical picture of the renal complication may take one of three forms: microscopic hematuria in which pain is only sometimes present, gross hematuria usually accompanied by pain which clears up rapidly on withdrawal of the drug and ample fluid therapy and the hematuria in which despite remedial measures there is impairment of renal function which leads to nitrogen retention, anuria and death. These forms may appear as separate entities, but they may, in fact, constitute only progressive stages of the same process. Examples of the mildest form will be detected only by frequent microscopic examinations of the urine. In their absence renal complications will be detected only when they have progressed to the second stage. The author suggests that crystals of acetyl sulfapyridine, precipitated in the renal tubules, pelvis and ureters, produce bleeding, edema and possibly reflex spasm, which may in severe cases lead to ureteric obstruction, hydronephrosis and failure of renal function. Factors which enhance precipitation include intensity of dosage, rate of absorption and excretion, the proportion of free and conjugated sulfapyridine in the blood and urine, the amount of fluid intake and loss and the concentration and reaction of the urine. The most important prophylactic measure is a daily intake of not less than 3,000 cc. of fluid. Treatment of the first and second stages of the complication is simple and definitely effective. In the third stage, a favorable prognosis depends on the immediate institution of ureteric catheterization and lavage. This proved a life-saving measure in 1 of the author's patients.

Tubercle, London

22:159-182 (July) 1941

- What Are We Aiming at in Collapse Therapy? S. V. Pearson.—p. 159.
- Mobile Mediastinum. A. C. Penman.—p. 166.

Schweizerische medizinische Wochenschrift, Basel

71:781-804 (June 28) 1941

Treatment with Female Sex Hormones: Experiences and Practical Conclusions. R. Wenner.—p. 781.

*Chemical Structure of Sulfanilamide Derivatives as Determining Factor in Their Toxic Effect on Erythrocytes (Anemias with Inner Bodies). S. Moeschlin.—p. 789.

Aspects of So-Called Ileitis Terminalis. P. Buxtorf.—p. 792.

Plasmocytoma of Upper Respiratory and Food Passages. K. M. Menzel.—p. 794.

Medical Significance of Recent Developments in Physics and Technic of Irradiation. J. H. Müller.—p. 796.

Toxic Effect of Sulfanilamide Derivatives on Erythrocytes.—In an earlier report (*Schweiz. med. Wchnschr.* 70:786 [Aug. 17] 1940; abstr. THE JOURNAL, Oct. 19, 1940, p. 1410) Moeschlin called attention to the fact that some derivatives of sulfanilamide cause the appearance of anemias in which the erythrocytes contain inner bodies. This observation induced him to investigate in animal experiments to what extent the inner body reaction is determined by the different chemical structure of the various sulfanilamide derivatives. The experiments were made on white mice, and comparatively high doses were used. It was found that unaltered sulfanilamide exerts the strongest inner body reaction and sulfapyridine takes second place in this respect. Other heterocyclic sulfanilamide preparations cause much weaker inner body reactions and produce no real anemia. Use of sulfathiazole never results in the formation of inner bodies, but sulfamethylthiazole causes some inner body reaction. These observations indicate that the toxic action on erythrocytes and hemoglobin, as well as the hemolytic anemias occasionally elicited thereby, is probably the result of the structure of the sulfanilamide derivatives. If the sulfanilamide group can be separated from the compound, its oxidation products seem to elicit toxic effects. Experiments on mice, by revealing the inner body reaction produced by newly introduced sulfanilamide derivatives, will help decide whether the clinical use of the new compounds is likely to become complicated by hemolytic anemia.

Boletín de la Sociedad Cubana de Pediatría, Habana

13:357-392 (Aug.) 1941. Partial Index

Neurofibromatosis (Recklinghausen's Disease) in Girl Aged 3½ Years: Case. T. Valledor, L. Expósito, A. de Feria and A. Sainz de la Peña y Nodarse.—p. 357.

*New Test for Functions of Liver. A. Castellanos and J. Beato Núñez.—p. 382.

New Test for Liver Function.—Castellanos and Beato Núñez describe a carotene test for liver function which involves an easy technic, based on the physiology of the liver. The patient takes fruits or fruit juices instead of breakfast. Five or 6 cc. of blood is withdrawn. Then an intravenous injection of 0.2 mg. of colloidal carotene for each kilogram of body weight is administered. Five minutes later blood is again withdrawn. The amount of total carotenoids in the blood is separately determined in the two different blood specimens by the Clausen and McCoord method. The carotene content in the two samples of blood, namely those which were withdrawn before and five minutes after the intravenous injection of carotene, is the same when hepatic function is normal. Any increase of the carotene content five minutes after the intravenous injection of carotene indicates hepatic insufficiency. The authors verified the results by comparing them with those of the classic tests. They studied the relation between the results of the test and the anatomic conditions of the liver by means of puncture biopsy and in some cases by autopsy. They conclude that the test is reliable and better than the classic tests. The article is a preliminary note.

Revista Argentina de Neurol. y Psiquiat., Rosario

6:1-68 (March) 1941. Partial Index

*Pituitary (Cushing's) Basophilism. T. Fracassi.—p. 3.
Hereditary Cerebellar Ataxia Associated with Adiposis and Dystrophia of External Genitals. T. Fracassi, D. E. García, R. J. Taltavull and L. Imelio.—p. 13.

Pituitary (Cushing's) Basophilism.—Fracassi reports 3 cases of basophilism of the pituitary type. The symptoms were typical in all cases. Two of the patients had complete impotence. One had osteoporosis. The menopause was the stimulat-

ing factor for the development of the disease in 1 case. High voltage roentgen therapy on the hypophysis and polyglandular opotherapy early in the course of the disease resulted in the cure of a patient. The patient in the menopause had relief of the menopausal symptoms from administration of an estrogenic substance. The enormous lipodystrophic tissues were removed by lipectomy.

Revista Médica del Hospital General, Mexico, D. F.

3:478-525 (June 15) 1941. Partial Index

*Sulfapyridine in Therapy of Mucosanguineous Colitis. R. Aguilar.—p. 504.

Sulfapyridine in Colitis.—Aguilar reports good results from sulfapyridine therapy of mucosanguineous colitis. Administration of 100 to 150 mg. of sulfapyridine per kilogram of body weight in twenty-four hours was in the great majority of instances followed by an improvement, sometimes dramatic, and by cure of the patient in two or three days. The author's experience is based on treatment in 200 cases. He advises the systematic use of sulfapyridine in the treatment of mucosanguineous colitis in association with proper diet, symptomatic treatment and transfusions of blood or serum.

Deutsche medizinische Wochenschrift, Leipzig

67:587-614 (May 30) 1941. Partial Index

After-Care of Patients with Diabetes Mellitus. F. Bertram and H. Bünger.—p. 587.

*Therapy of Pernicious Anemia Refractory to Liver Treatment. A. Budding.—p. 591.

*Hypoprothrombinemia, Tendency to Hemorrhage and Hemoptysis in Pulmonary Tuberculosis and Their Modification by Vitamin K. G. Bauer.—p. 594.

Diagnosis of Acute Lupus Erythematosus. L. Thelen and H. Weil.—p. 598.

Function of Ruptured Kidney: Casuistic Contribution to Traumatic Renal Rupture. Antonina Sarens.—p. 600.

Pernicious Anemia Refractory to Liver.—Budding reports 2 cases of pernicious anemia in which generous doses of potent liver extracts failed to improve the blood picture. The first of these patients had gastrointestinal disturbances and lived chiefly on gruels, excluding from her diet practically all foods which provide the body with nicotinic acid or its amides. The second patient had achylia, which made for deficient absorption. Her diet likewise consisted chiefly of carbohydrates and consequently was relatively deficient in vitamin B₁, since it is known that vitamin B₁ requirements are greatly increased if the carbohydrate content of the diet is high. The patient also had exophthalmic goiter and a high metabolic rate, which is known to increase further the vitamin B₁ requirements. The blood picture of the first patient rapidly improved when nicotinic acid amide was given in addition to liver extract; in the second patient the same result was accomplished by adding vitamin B₁ to the diet. The author concludes that the failure to respond to liver therapy was due to impairment of vitamin equilibrium.

Vitamin K in Pulmonary Tuberculosis.—Bauer calls attention to the difficulties encountered in the determination of the prothrombin blood content and reports studies on it in patients with pulmonary tuberculosis. Some patients showed considerable reduction in prothrombin, which could be temporarily combated by administration of vitamin K. There was no parallelism between the severity of tuberculosis and the prothrombin reduction of the blood. Among 30 patients with a tendency to hemorrhages there were only 8 who had a noticeable reduction in prothrombin. The concentration of prothrombin can be considerably increased by the injection of vitamin K. This increase can still be demonstrated thirty-six hours after the injection. It does not develop with the same rapidity in all patients; in some it is not ascertainable for twenty-four hours after the injection. An especially low prothrombin concentration was observed in 2 patients who for weeks had had diarrhea (amyloidosis, intestinal tuberculosis). Absorption disturbances and amyloidotic changes at the sites where prothrombin is formed are regarded as causes. Irregularity in prothrombin reduction of the examined patients suggests that it is caused by the toxic impairment of an organ (liver). In 10 patients the prothrombin content of the blood was examined in the course of hemoptysis. A reduction could be ascertained in 5, and in 2

of these the hemorrhage ceased when the prothrombin content increased following administration of vitamin K. In 2 others hemoptysis took place in spite of an increase in the prothrombin content even during the administration of vitamin K. In 1 patient the bleeding ceased even before an increase in prothrombin was demonstrable.

Acta Medica URSS, Moscow

3:359-504 (No. 4) 1940. Partial Index

- *New Ways in Surgical Treatment of Profuse Gastroduodenal Hemorrhage. S. S. Yudin.—p. 359.
Radical Therapy of Cancerous Neoplasms of Cardia and of Lower Portion of Esophagus. A. G. Savinyeh.—p. 382.
Cholecystitis. P. G. Tschassownikow.—p. 407.
Surgical Treatment of Uterine Carcinoma and Its Late Results. B. A. Archangelsky and O. E. Nudolskaja.—p. 425.
Anatomy of Pterygopalatine Ganglion and Problem of Its Anesthetization. M. F. Iwanitzkij and A. I. Feldmann.—p. 432.
*Etiology of Tick (Spring-Summer) Encephalitis. W. D. Solowjow.—p. 484.

Surgical Treatment of Profuse Gastroduodenal Hemorrhage.—Discussing the divergence of opinion regarding the treatment of severe gastroduodenal hemorrhage and the discrepancies in the mortality from this cause, Yudin points out that massive and acute hemorrhages are not due to ulcer in all cases. Finsterer maintained that in 10 per cent of cases massive gastric hemorrhage is caused by disorders other than ulcer; Balfour asserted that this percentage was from 20 to 25 and the author found it to be over 36. The peril to the patient's life is much greater from the ulcerous than from the non-ulcerous hemorrhages. Neither the combination of all conservative measures nor repeated transfusions can save a patient's life if a vessel of considerable caliber has been eroded in a callous ulcer. In most cases resection of the stomach is indispensable. The "exclusion" operation and simple gastroenterostomy are of no use, and in severe cases they would involve an unjustifiable additional risk. Ligation of all vessels around the ulcer may be practical in rare cases, that is, when the ulcer is in accessible parts of the anterior wall of the stomach or the duodenum. Cases in which surgical treatment was given for profuse gastroduodenal hemorrhage may be divided into three groups. The first group includes cases in which hemorrhage had already ceased, collapse had disappeared and the hemoglobin content and the number of erythrocytes were already on the increase. The intermediary stage operations resulted in a mortality of 7.5 per cent (8 deaths in 106 cases). The second group includes 97 cases of emergency operations, the patients being operated on immediately after arrival at the clinic. There were 16 deaths in this group. The third group, in which "desperate operations" were done, includes only cases of severest anemia and intractable hemorrhage. Judging chiefly by the caliber of the eroded vessel, it can be asserted that the patients in this third group would have died if only conservative treatment had been employed. More than half of these patients were saved. During or immediately after the operation, patients with gastroduodenal hemorrhage should be given abundant blood transfusions. Great stores of cadaver blood available at the author's hospital made it possible to venture immediate gastric resection in some cases with an apparently hopeless prognosis. Cadaver blood has proved especially valuable since the drip method has made possible the transfusion of really large quantities. Cadaver blood simplified the problem of donorship for enormous drip transfusions; instead of the blood of four to ten donors being mixed, blood from one to three donors is sufficient for one drip transfusion, and the risk of hemolysis is greatly reduced. Furthermore, since the discovery of fibrinolysis in the blood after sudden death (Skundina), it has been possible to dispense with stabilizers and anticoagulants. It is possible to store cadaver blood without the addition of preservatives.

Etiology of Tick Encephalitis.—Solowjow reports that in recent years a peculiar form of encephalitis has been observed in the forest regions of Siberia. It begins suddenly with high fever, severe headache, vertigo and vomiting. Together with meningeal symptoms, localized symptoms of involvement of the central nervous system develop in the form of paralysis in the region of the upper and lower extremities and in the musculature of the neck and back. The fever persists for four to ten days. Some patients retain permanent atrophic paralysis, par-

ticularly of the proximal portions of the upper extremities and of the musculature of the neck and shoulder regions. The mortality is 30 per cent. The pathologic-anatomic changes in the central nervous system recall descriptions of the Japanese (summer) encephalitis and of the American (St. Louis) encephalitis. The epidemiologic picture of tick encephalitis is characterized by the strict seasonal character. It begins about the end of April, reaches its severest stage the end of May and the first part of June and then declines, only a few sporadic cases occurring after July. The appearance of the tick encephalitis seems to be connected with work in the taiga (swampy forests of Siberia), particularly with the sartige of these regions. The climatic conditions at the time of occurrence are characterized by moderate temperature, high humidity and considerable precipitation. The chief epidemiologic characteristics can be explained by the existence of vectors—that is, ticks of the family Ixodidae. The seasonal occurrence of tick encephalitis follows the period of maximal activity of these ticks. The vector role of the ticks was demonstrated by the detection of spontaneously infected Ixodes persulcatus in the regions where the disease was endemic, by long survival of the virus in artificially infected ticks, by virus transmission by bite and by virus transmission by the transovarian route and in the course of metamorphosis. At the same time that the ticks were studied the possibility of a virus reservoir among the forest mammals was investigated, and it was found that some rodents and insectivores harbor the virus. A considerable percentage of human subjects living in the region where the disease was endemic had a neutralizing antibody content against the encephalitis virus, and the serum of cattle, horses and other animals disclosed the same protection. Tick encephalitis is caused by a neurotropic, filtrable virus which is pathogenic for white mice, monkeys, some rodents and birds. The most reliable method of culturing the virus is transmission to the mouse of a brain emulsion from human beings who have died of the encephalitis. The virus resembles the causal agents of other seasonal forms of encephalitis (Japanese and St. Louis) and differs from them in certain serologic characteristics. The author thinks that the reported studies permit the assumption that the causal agent of tick encephalitis is a specific ultravirus closely related to that of Japanese summer encephalitis.

Acta Chirurgica Scandinavica, Stockholm

85:1-260 (July 11) 1941. Partial Index

- Procaine Hydrochloride Block of Stellate Ganglion: Therapeutic Aid in Sensory Disturbances Caused by Cold. J. Adams-Ray.—p. 1.
Rare Vascular Tumors of Central Nervous System: Four Cases. N. Antoni.—p. 7.
*Tumors of Parathyroid Glands. H. Bergstrand.—p. 25.
Astrocytomas of Corpus Callosum: Symptoms and Surgical Treatment. E. Busch.—p. 76.
Aspects of Mycotic Changes of Brain. T. Hafström, O. Sjöqvist and F. Henschen.—p. 115.
Question of Chronic Subdural Hematoma. N. Liedberg.—p. 165.
Skeletal Changes in Meningioma of Pontile Angle Which Stimulated Acoustic Tumor: Two Cases. E. Lysholm.—p. 195.
Familial Occurrence of Cerebellar Angioma. G. Norlén.—p. 198.
Contribution to the Knowledge of Primary Epidural Tumors of Spinal Canal. A. Snellman.—p. 248.

Parathyroid Tumors.—Bergstrand reports 9 cases of primary hyperparathyroidism. High blood calcium values were present. All the parathyroids of 4 patients were examined and, in 3, more than 1 was appreciably enlarged. In 1 instance it was demonstrable that the adenoma-like new growth involved only one gland. This point could not be determined in 5 cases because the material was obtained at operation or at incomplete necropsy. The author reports a tenth case in which symptoms indicated attacks of acute parathyroid poisoning with disturbances in the cardiac rhythm and blood pressure and gastrointestinal function. Necropsy showed the inferior right and left superior parathyroids to be plum sized and the other two to be more than twice the normal size. Microscopic examination revealed all four parathyroids with large cells rich in protoplasm and free from fat. The newly formed parenchyma in both large tumors consisted of a collection of adenomatous nodules. Such adenomatous parathyroids may exhibit regressive changes similar to those found in the adenomatous goiter. The interstitial connective tissue may increase in amount and become hyalinized, even calcified. Cysts may develop through the collection of follicles dilated by a colloid-like mass or

through softening of degenerated, disintegrating tissue. The study indicates that, in a large number of cases, both the primary and secondary parathyroid enlargement appears anatomically like an adenomatous hyperplasia, analogous to the conditions in thyrotoxicosis. The secondary hyperplasia may be diffuse, but it seems to be able to develop into an adenomatous hyperplasia similar to that in the formation of adenomatous areas of the thyroid. Regarding the supposed primary parathyroid enlargements, many were multiple adenomatous formations in a diffusely changed parenchyma. It is therefore probable that the primary neoplasms in these cases may often actually be secondary to some unknown irritation. If an irritation first produces diffuse hyperplasia and then adenoma-like formations it is easy to understand that the latter would show different degrees of demarcation and different microscopic structures in the same gland. In most cases of osteitis fibrosa the parathyroid enlargement does not resemble a parathyroid tumor but a parastruma. This does not mean that real neoplasms do not exist. The nature of the irritation is most likely a disturbance in the calcium metabolism. That the patients often recover or improve after one or more enlarged glands are removed is no more remarkable than the improvement following partial strumectomy in thyrotoxicosis.

85:261-360 (Aug. 20) 1941

- *Experiences with Primary Cholangiography with Particular Consideration of Possible Impairment of Pancreas. N. Liedberg.—p. 261.
Abdominal Pain and Dorsal Splanchnic Anesthesia. O. Hultén.—p. 281.
Combined Evipan-N₂O Anesthesia. T. P. Störtebecker.—p. 299.
Megaloureter in Girl Aged 5. A. Grevillius.—p. 317.
*Clinical Aspects of Traumatic Subcutaneous Rupture of Intestine. N. Liedberg.—p. 325.
*Myxoglobulosis Appendicis. E. Hollström.—p. 347.

Primary Cholangiography.—Liedberg describes his experiences with primary cholangiography and stresses its great value, particularly in the diagnosis of calculi in the choledochus, in the diagnosis of tumors of the biliary passages and in the differentiation between benign and malignant pancreatic compression of the common bile duct. The method is simple and seems to involve no particular risks or disadvantages. However, in some cases pathologic diastasia has been observed after cholangiography, which seems to indicate that the method may have an irritating effect on the pancreas. For this reason, caution is necessary in the injection of the contrast medium in order to avoid great excess pressure, and particularly in cases of acute cholangitis reserve is advisable with the use of cholangiography.

Traumatic Subcutaneous Rupture of Intestine.—Liedberg discusses 52 cases of subcutaneous traumatic intestinal ruptures. Since most of the patients came from rural regions, it is understandable that the kick of a horse was the most frequent cause of trauma (in 32 cases). Hernia existed in 11 (20 per cent) of the patients. In 5 of these 11 the traumatic agent struck the hernia directly; in some of the other cases the hernia indirectly played a part in the development of the intestinal rupture. Among the factors that are of importance for the early diagnosis of subcutaneous intestinal rupture, the author mentions careful analysis of previous history, particularly of the nature and intensity of the trauma; analysis of the nature of the pain; frequent inspection of the abdomen, because increasing muscular tension is of vital importance; rectal palpation, particularly for sensitivity to pressure in Douglas' region; observation of the pulse, because increase in its frequency is a warning, and examination of hernial regions and roentgen examination in obscure cases. If intestinal rupture is certain or highly probable, laparotomy is necessary. Experience indicates that the earlier the operation is performed the better are the results. However, some writers advise against operation during the period of shock. The subcutaneous intestinal rupture can usually be repaired by suturing; resection is necessary only in case of extensive or multiple tears or when long portions of the mesentery are torn away from the intestine. The total mortality in the reviewed material was 36 per cent. Of patients operated on during the first six hours 23 per cent died; of those operated on later 50 per cent died.

Myxoglobulosis Appendicis.—Hollström describes a case of myxoglobulosis appendicis in a man aged 60. The patient was subjected to appendectomy twelve hours after the appear-

ance of the first symptoms. The surgical specimen, together with the globoid mucinous bodies which it contained, is reproduced in a color photograph. The author points out that myxoglobulosis has been designated also as "fish egg mucocoele." Obliteration of the appendix, increased secretion of mucus and absence of purulent bacteria play a part in the development of mucocoele, but the development of myxoglobulosis requires in addition a mechanical factor and possibly a colloid chemical process. The author reviews the theories that have been advanced with regard to the development of the globules of mucus. On the basis of figures cited by other investigators he estimates that myxoglobulosis is observed about once in every 47,500 appendectomies. Of 36 cases of myxoglobulosis described in the literature, in 7 the disease had given rise to pseudo-myxoma peritonei, and in 1 case the myxoglobulosis appendix had encircled a coil of the small intestine, its apex adhering to the cecum and thereby giving rise to ileus. In the other cases myxoglobulosis had produced symptoms of appendicitis, had been found accidentally in the course of operations made for reasons other than suspected appendicitis or had been noted in the course of necropsy.

Nordisk Medicin, Stockholm

11:2117-2164 (July 12) 1941. Partial Index

Hospitalstidende

- *Investigations on Relation of Sedimentation, Serum Proteins and Sternal Punctate in Serum Sickness. H. Gormsen and F. Heintzelmann.—p. 2125.
Serum Treatment in Appendicitis. B. J. Fog-Møller.—p. 2129.

Relation of Sedimentation, Serum Proteins and Sternal Punctate in Serum Sickness.—In 11 of 13 patients with serum sickness after treatment of pneumonia with rabbit anti-pneumococcus serum and in 1 patient with serum sickness after treatment of diphtheria with horse diphtheria antitoxin Gormsen and Heintzelmann established a definitely increased sedimentation reaction, while 6 of 7 patients given similar treatment without serum sickness showed steadily decreasing sedimentation values. In 2 of 3 grave cases of serum sickness they found severe hyperglobulinemia, and in the third case the maximum normal globulin value; in 1 moderately grave case and in 1 mild case the globulin values were normal. In the 4 most severe cases of serum sickness there was a pronounced increase in the plasma cells in the bone marrow. Both the serum globulin and the plasma cell values in the bone marrow were normal in 4 control patients not given serum treatment and examined in the same stage of the primary disease (pneumonia) as the patients with serum sickness. The authors assume that the hyperglobulinemia, which may depend on an antibody formation, is connected with the demonstrated increase in the plasma cells of the bone marrow. This is seen to support Bing and Plum's theory of the plasma cells as formers of globulin.

Ugeskrift for Læger, Copenhagen

103:731-762 (June 5) 1941

- Osteomyelitis and Trauma: Significance of Traumas in Pathogenesis of Hematogenic Osteomyelitis Disorders. H. Thomsen.—p. 731.
Westhues' Treatment of Fractures of Calcaneus. K. Lehmann.—p. 738.
*Treatment of Inguinal Hernia in Children: Results of Lorthior's Method. K. H. Kjøster and P. Fix.—p. 744.
Gonadotropin Treatment of Sterility: Discussion of Case. S. Franck and C. Hamburger.—p. 748.
Fracture of Lesser Trochanter. T. S. Hansen.—p. 749.
Case of Isolated Fracture of Lesser Trochanter. P. N. B. Eliassen.—p. 751.

Treatment of Inguinal Hernia in Children.—Kjøster and Fix say that inguinal hernia in childhood is congenital and depends on the persisting processus vaginalis (canal of Nuck). At any time after birth the bowel or other viscus may descend into this preformed sac. The treatment is operative. The operations should be performed as early as possible by a simple technic, with removal of the hernial sac and avoidance of plastic surgery, best and most rapidly according to Lorthior's method. Follow-up of 113 cases of inguinal hernia in children operated on according to Lorthior and Czerny showed testis atrophy in 2 but no recurrence. In eighteen inguinal hernias in children operated on by other methods there were 2 cases of testis atrophy and three recurrences. The average time of observation was eight and a half years.

THE STUDENT SECTION

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TRAINING OF INTERNS IN THE SOCIAL ASPECTS OF ILLNESS

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Since 1929 a plan for the training of interns¹ in the social aspects of medicine has been carried on at the Beth Israel Hospital, Boston.² The purpose of this paper is to present an evaluation of this plan following ten years' experience.

The plan has aimed to develop an appreciation that (1) the practice of medicine is not merely the treatment of sickness but the care of sick persons, (2) the everyday circumstances of life play an important role in creating illness, (3) illness with its accompanying problems often disrupts normal existence and (4) consideration of social factors is consequently an inseparable part of the process of diagnosis and treatment. The objectives of the plan have been met by requiring the senior intern to:

- (a) Acquire comprehensive social knowledge himself about each patient in his ward.
- (b) Discuss these data at regular weekly medical social ward rounds with the resident and the medical social worker assigned to the particular service.
- (c) Share the responsibility for plans for therapy or after-care based on the realities of each patient's social as well as medical needs.

During his six month period as senior at this hospital, the intern studies and treats approximately 300 patients. By the systematic consideration of every patient in the ward in the manner described, he realizes, through the many vicissitudes in the treatment of patients, that there are interrelationships between the

patient's personality, his social environment, his illness and his response to medical therapy. The practice of considering each patient individually in his social as well as his physical aspects becomes an established habit of thinking, persisting in private practice or medical teaching.

A procedure of this sort places on the intern additional responsibility beyond the technical medical study and treatment of patients. It is time consuming. It involves for most interns a new orientation in thought concerning patients and illness, for during most of four undergraduate medical years the student has, with some exceptions, concentrated largely on the physical and scientific aspects of disease.

During undergraduate study, treatment has been viewed usually from the standpoint of drugs, surgery, roentgen ray and other technical procedures. The great amount of technical medical knowledge which must be crowded into the short time available to the students during the latter part of their undergraduate study makes it increasingly difficult for them to see each patient in all his dimensions and with perspective. Instead of the hospitalization period being an episode in the patient's life, it frequently occupies the full range of the student's view. Though patients have been seen by some students with their individual physical and even psychic differentiation, not enough emphasis has been placed during undergraduate study on:

- (a) The patient in his social setting.
- (b) The interaction of the patient's social situation and his illness or disability.
- (c) The patient's attitude toward the situation created by his illness.
- (d) The difficulties involved for the particular patient in a proposed plan of care.
- (e) The possibilities of the recommended plan being carried out.

In certain teaching hospitals, conferences on the medical and social interrelationships of illness in the case of a few patients have been carried out.³ These discussions have been of value in demonstrating to the medical student

From the Medical and Social Services, Beth Israel Hospital, and the Departments of Medicine, Harvard Medical School and Tufts College Medical School.

1. Derow, H. A., and Cohen, Ethel: The Training of Interns in the Social Aspects of Medicine, *New England J. Med.* 209: 827-831 (Oct. 26) 1933.

2. A two hundred and twenty-five bed voluntary, nonsectarian, general hospital and outpatient department, with teaching affiliations with Harvard Medical School, Tufts College Medical School and the Simmons College School of Social Work.

3. Cohen, Ethel, and Derow, H. A.: Teaching Medical Students Objectives for Care of Patients and Social Aspects of Illness, *Arch. Int. Med.* 56: 351-359 (Aug.) 1935.

the existence of another important phase of medicine. This experience, though valuable, is brief and usually not comprehensive enough to help him with the individual problems he meets later during his internship and in his private practice.

During the internship period the young physician becomes responsible for the care of patients; then the need for understanding sick people and helping them with their problems becomes vivid.

MEDICAL SOCIAL WARD ROUNDS

The procedure that serves at the Beth Israel Hospital is known as "medical social ward rounds" and is conducted at a specified time each week. The resident physician, the senior intern and the medical social worker assigned to the service meet and discuss each patient. The senior intern presents a statement of the social data which he has secured himself in interviews with each patient, including facts relative to home conditions, economic stability and factors for consideration of after-care. The intern is expected to know the type of home and neighborhood from which the patient comes and the suitability of this environment for convalescence. He must know whether the patient has a dependent family or whether there are children at home without care about whom the patient may be worried. The possible existence of emotional factors or conflicts within the home must also be appreciated. In regard to economic stability, he should learn whether or not the patient has financial worries, is unemployed or is in fear of losing his job while ill. From the beginning the intern should realize that he will be asked for advice as to the patient's after-care, and he must therefore consider whether the patient can understand and will follow instructions and whether he will be able to carry heavy housekeeping duties or be able to provide for a special diet or appliance if necessary. Also he should study the possibilities of the need for adjustment of occupation or of school work. In addition to these social data, the intern describes the medical aspects of the patient's illness during medical social ward rounds. This includes a statement of the patient's physical and mental condition, the probable duration of hospitalization, the outlook for the immediate present and for the long range view, a statement relative to ability to resume activity or need for its limitation at home, at work or at school, and recommendations as to the type of care that the patient will require following discharge from the hospital.

This material is discussed by the three participants in this procedure, and a decision is made as to which of these patients present problems which the medical social worker should take

up for further social study and case work service. During these rounds the medical social worker also reports on the developments in the patients still in the wards whose problems had been taken up on previous rounds. After all the cases have been presented, they are reviewed briefly to determine which seem to call for immediate attention and which may be deferred. This joint evaluation and discussion, valuable for its own sake in promoting further thought on these problems, is necessary also because of the social service department's policy of limitation of intake and selection of problems accepted for service.

In the intervals between these weekly rounds, the intern, and frequently the resident and the medical social worker, have numerous informal discussions concerning progress in the patients under their care. In addition, the interns often request the medical social worker to join a discussion of the patient's condition and future care with the relatives after the regular ward visiting hours.

The medical diagnoses, prognoses and general questions of after-care are, of course, taken up by the visiting staff on the regular daily morning ward rounds with the interns in attendance. The data secured during these daily visits with the staff physicians form the basis for the material which the senior intern presents at the medical social ward rounds. The visiting physicians are occasionally consulted by the senior intern and the social worker in special types of cases. These include the following situations:

(a) When the recommendation is made for a radical change in the patient's work or general way of life.

(b) When the medical social plan is not accepted by a patient seriously ill and a safe compromise is needed.

(c) When social plans involve large expenditures of money, either by the patient or by the community, for chronic or convalescent care.

(d) When the diagnosis is still in doubt, and the patient does not require further hospital care for an acute condition but home facilities seem inadequate.

(e) On a small miscellaneous group of complex and delicate problems which require more mature judgment.

It is to be noted that this procedure has been carried on in both the surgical and the medical ward service. Initially, we accepted the common opinion that the surgeon's preoccupation with the technic of operative and postoperative care precludes interest in the social and emotional aspects of his patients' illnesses. We no longer hold this view. Some of the most thoughtful, imaginative and responsive men have been interns in surgery. Despite the exigencies of urgent operations and the unexpected post-operative emergencies, surgical interns have served as well in this procedure as the medical interns.

The Learning Process Through Joint Thinking and Discussion Between Intern, Resident and Social Worker.—When the intern begins his experience with medical social ward rounds he is apt to disregard social data as unimportant and to dismiss certain patients with the remark "there is no social problem here." He may believe this because of his inability to evaluate the social history he has secured. The social worker, however, appreciating that the intern has not yet had the experience to justify this statement, asks him what he found the situation to be. Sometimes the intern has adequate information and believes that he is as able to make a judgment as valid as the social worker's. However, because of the difference in training and professional orientation, the same facts often have different significance for the intern and the medical social worker. Two brief examples are presented here for illustration:

CASE 1.—A man aged 42, a moving picture operator, was unable to resume work because of severe malignant hypertension. He earned, when employed, \$90 a week. He owned the home in which his wife and four young children lived. The intern believed that an intelligent patient of this economic level required only medical care from the physician with no further concern by the physician or any one else. The serious nature of the illness, the patient's feelings about his situation, the need for the patient's adequate care following hospitalization and the question as to the potential dependence of his wife and young children during the terminal phase of the illness and afterward were the implications which impressed the medical social worker from the facts as finally related by the intern, rather than the income and home ownership. A subsequent interview with the patient and family revealed the patient greatly worried because of heavy debts, no savings, threat of losing his heavily mortgaged home, dependence on friends and relatives and serious family friction and distrust.

CASE 2.—The intern learned from a ward patient that she was a dietitian, that her son was in a private school and that she had earned \$135 a month, but had not worked for five months because of illness and was living at a private club. The medical diagnosis was not clear and, since exploratory operation was being considered, a period of convalescence would be needed before she could return to work. The intern thought it unnecessary to spend any time beyond the strictly medical care of this patient because "she presents no social problem." He considered \$135 a month a large income and assumed the existence of other income or savings for the maintenance of a son at a private school. More significant to the social worker even than the patient's wages was the five month period of unemployment because of illness. Also, she wondered what kind of "private school" would take a boy whose mother had not earned even her usual \$30 a week for five months. Additional study revealed the facts that the "dietitian" was a domestic employed at \$10 a week and that her illegitimate son was in an institution under the care of a social agency. The club which the intern named as the patient's home was known to the social worker as a place where unemployed working women could procure food and lodging for a temporary period. There was no possibility of convalescent care there.

It is clear that the intern had not been aware that the "facts" lacked inner consistency, nor

had he been concerned with the possible reason why the patient felt it necessary to present herself in this light.

At times the intern may present social data without understanding the significance of the data for the particular patient discussed. The social worker asks for more information which would apply particularly to the age, marital status, occupation, responsibilities and attitudes of the individual patient. She may raise questions about the medical data, such as What is the significance of this illness? Is it progressive, self limited or will it be quiescent for a period and become reactivated later? How does the type and extent of the illness affect a particular patient? The self-limited illness in a given patient may present no special problems which the patient or his family cannot manage themselves, but a chronic progressive illness of the same patient and with the same social situation may change the pattern of life of the patient and his entire family.

Through such continuous questioning the intern becomes increasingly aware of the need for relating the patient's social situation to the particular medical problem. The social worker shares with the intern the knowledge that she has gained in her social study of a particular patient through interviews with family, social agencies, school or other relevant sources. Her data may either confirm his social history, elaborate on it or correct it. Her contribution will be the result of her skill derived from training and experience in her own specialized field of social work. In time, the intern gains appreciation of the meaning and interrelationship of the various social and medical data. Just as the trained medical social worker through experience gains an appreciation of the prognosis and possible plan of treatment in certain illnesses, so does the intern in the course of time develop skill in gathering and evaluating social data and an awareness of the inherent relationship of potential social factors with certain medical diagnoses. This process, which was at first conscious and deliberate with practice, becomes less conscious and more habitual.

Usually one of the foremost objectives of the intern is disposition of the patient, making possible new admissions and new medical experiences. While this primary objective of the house officer is being furthered by the social worker indirectly, the intern is becoming habituated to the consideration of the social factors of each patient.

The resident contributes to both intern and social worker from his longer experience and greater knowledge. The intern and social worker each has his own particular function and professional skill, but neither can carry out his function in the care of the patient completely

by himself. At certain points and many times their functions are interrelated and merge. They must think and practice in coordination and harmony.

The development of understanding, insight and skill is a gradual process. The rate of progress depends on many factors within the intern and within the medical social worker; their ability to "give and take," to interpret to each other the special knowledge each has and to accept each other as professional workers sharing in the study and care of the sick.

Subjects Discussed During Medical Social Ward Rounds.—A wide range of subjects is covered in the course of the discussions during rounds. These relate to the particular problems encountered or the obstacles to the carrying out of the plans agreed on. Some of these subjects are:

1. The description of the elements of a home maintained on a marginal or substandard income.

2. The effects on the patient's immediate health and on family life of overcrowding, inadequate equipment, insufficient heat, light and air.

3. Description of various community resources, their policies and the conditions of acceptance for service or care.

4. The absence of necessary resources, the consequent need to devise substitutes and to consider relative advantages or disadvantages of several possible alternatives for the case in question.

5. The influence of the various racial and cultural traditions and customs on the patient's and family's relationships to each other, to certain kinds of illness, to hospitalization, to home care, to diet and to dependence.

6. The influence of emotional strain, economic inadequacy and other unfavorable social conditions on the illness.

7. Analysis of factors for consideration in securing "complete rest" or "modified activity" for a mother with small children; for young or old persons living alone in a rooming house or hotel and like situations.

8. The unfavorable effect on the sick person of demands that unwilling relatives provide care, as contrasted with the more favorable opportunity for the patient's improvement when the responsibility for care is assumed in adequate community resources.

9. The need to understand the forces operating in the so-called uncooperative patient who demands discharge against advice; the hospital's responsibility to see that the patient may know how to secure sound medical care elsewhere or to allow the patient to return to the hospital again if he wishes.

10. The importance of ascertaining the physical and emotional health of relatives who will bear the burden of care for seriously handicapped or chronically ill patients.

11. The importance of weighing both the probable psychologic and the economic effects on the individual patient of recommendation to give up work entirely or to change radically his occupation even in the presence of a chronic progressive illness.

12. Appreciation of the length of time needed by the medical social worker, community social worker or family to mobilize resources, even when all are working at maximum speed, and the variation in amount of time needed because of varying intelligence, emotional maturity of patient or relatives and financial resources.

13. The hospital's responsibility for care of the patient as its major responsibility, as well as the advancement of the intern's opportunity for handling a maximum number and variety of patients.

These by no means constitute all the subjects discussed during rounds or in the intervals between rounds. All these concepts and undoubtedly many more are the subject of discussion in all hospitals where trained medical social workers and interns work together. The significant difference in the plan here described is that these discussions are habitual, regular and frequent and include a large number of patients. The cumulative knowledge and the increase in understanding derived from experience with a large number of cases tend to develop in the intern the habit of considering all his patients in terms of the nonmedical aspects.

PARTICIPANTS IN THE PLAN

The Intern.—Interns vary considerably in the rapidity and manner in which they learn to appreciate the importance of social factors in disease. This is because of differences in personality, interest in people, administrative ability as senior wardman, degree of confidence relative to medical knowledge, ability to accept questions from the social worker which the intern may not be able to answer and to acknowledge the need to consult the visiting physician. Interns with whom representatives of other departments have difficulty will usually present difficulties in relations with the social worker.

The integration of previously acquired scientific knowledge with newly acquired social concepts may at first be difficult. It is definitely influenced by the intern's previous social experience and in turn often involves change in his social outlook. Problems of patients often stir up problems in the intern's own life, producing subjective reactions that influence his thought and activities concerning the patient. For example, some men who have earned their way through school, college and medical school, carrying family burdens as well, at first believe that every one else could help himself if he "willed" to do so. Not "willing" to do so, the patient is therefore unworthy of help from society. Other men coming from an economically well favored environment initially may have no appreciation of pain, want, loneliness, strife or of the dread of dependence, while others from similarly well favored backgrounds may be overprotective and urge assistance even when none is desired by the patient. For many patients independence and self maintenance, even on a meager scale, are their most treasured possessions.

The Resident.—Brief reference has already been made to the role of the resident. In the

organization of the Beth Israel Hospital, the intern is responsible to the resident. The resident's presence during medical social ward rounds provides the medical social worker with support and authority which is especially necessary in the early period of each senior intern's experience. The resident can often influence the intern's evaluation of the patient's condition, prognosis and needs following discharge from the hospital. From the resident's comments the social worker likewise gains considerable medical knowledge and understanding.

A resident indifferent to this aspect of medical care may be a real handicap to both intern and social worker, while an interested resident can greatly further its development.

The Medical Social Worker.—The high degree of cooperation involved in this kind of teamwork requires tact, stability and resourcefulness on the part of the social worker. Her contribution will be more effective as she learns how to share her specialized knowledge with the intern. She must be mature enough emotionally to accept some interns' reluctance at times to share medical data sufficient for her comprehensive understanding of the total medical situation and their unwillingness at times to accept her interpretation of emotional and social factors and their relationship to the particular patient's medical problem.

Our experience has demonstrated that the medical social worker participating in this procedure should be a well prepared, professionally experienced and mature person. She must be secure in the knowledge of her own function and of the philosophy and concepts of present day social work. Unless she is able to express her ideas clearly and to demonstrate them convincingly through her practice, she will have little success in influencing the young physician's point of view or in stimulating his interest in a broad concept of medical care. She must know how to work understandingly with the intern whose authority as senior wardsman is important to him but whose theoretical knowledge has not yet been tempered by professional experience. The knowledge acquired over a period of years by medical social workers from close working association with physicians in a procedure of this kind increases their usefulness to the patient, to the hospital and to other community agencies.

The advantage of having the same medical social worker assigned to these ward rounds for a long period of time is considerable. Opportunity for cumulative learning and understanding of the intern's problems and psychology can be attained only by continuous experience with many different interns. Because of the periodic changes of interns, the possibilities of the maintenance of this system of rounds is greatly

enhanced by continuity in service of the same medical social worker. As each man completes his training period, he is succeeded by another intern. The resident may serve for one year only. Thus, the entire process is recreated anew every few months. The medical social worker is the one practitioner in this team who, because she is a permanent staff worker, can promote the purposes of an integrated service to the patient.

EVALUATION BY THE GRADUATES OF MEDICAL SOCIAL WARD ROUNDS

Throughout these years we have been formulating our own conclusions as to the values of the plan from our observations and indirect participation, but we desired in addition the testimony of men who had actually had the experience and had reacted to it in various ways. A conference was held with twelve graduates. Their comments were of such interest as to stimulate us to elicit the reactions of the entire number of interns and residents, fifty-three in all, who had participated during the ten years that the plan has been in use. The questionnaire method was decided on as the most practicable because many of the graduates were practicing in various parts of the country.

As interns, these fifty-three men were graduates of a number of different medical schools. They represented a variety of professional interests, skill and ability.

It was expected that some of the graduates would respond negatively to the rounds because of the amount of time and thought required in the whole process and because of certain psychologic reactions or social points of view. In order to secure full and free expression of opinion and comment, the questionnaire, worded so as to encourage negative replies, was sent out over the signature of the medical author only.

Subjects Included in the Questionnaire Sent to Graduates.—The graduates were requested to discuss the parts of the procedure to which they objected and to state whether they found it difficult to secure social information from the patient. They were asked to evaluate which aspects of the plan they considered of value to the patient, to the hospital and to themselves during their period of training and whether the experience had been of value to them in their private practice. The graduates who are now teaching medical students were asked to describe the method by which they bring into their teaching their consideration of the patient as a whole. They were also asked to suggest changes for improvement of the plan and to comment on any point not covered by the questionnaire.

Analysis of the Replies to the Questionnaire.—Replies were received from every graduate, in most instances within a week. An analysis was

made of the distribution of graduates as to present geographic location, field of practice and medical school teaching affiliations and is recorded in the accompanying tables.

There was considerable agreement on many points by both the medical and the surgical

TABLE 1.—*Field of Practice of Fifty-Three Graduates of Beth Israel Hospital*

Field of Practice	Number	Total
Medicine		34
Private Practice		
Internal medicine	20	
Gastroenterology	2	
Allergy	1	
General practice	2	25
Internships	2	2
Residencies	5	5
Full time medical research	1	1
Full time psychiatrist in mental hospital	1	1
Surgery		19
Private Practice		
Surgery	8	
Surgery, gynecology and obstetrics	2	
General practice, emphasis on surgery	4	14
Veteran's Administration	1	1
Residencies	4	4

graduates. A selection of their comments for this paper was made on the basis of characteristic replies or of evidence of unusual understanding of the aims of the plan.

1. Parts of the Procedure to Which Objections Were Raised: Seven medical graduates objected to the time taken up by the rounds from their other responsibilities. Two of these men believed that there was no advantage to be gained from rounds which could not be as well accomplished by some other technic. One of the men who had objected in the beginning that it was time consuming with experience changed his point of view, as it then "seemed a worth while expenditure of time."

Four surgical graduates, though they did not object to any part of the procedure, wished that they could have had more time to give to it.

2. Difficulties in Securing Social Information from Patients: Six medical and four surgical graduates found it difficult to secure financial data from the patients. This was the only point about which they thought that they had had difficulty in the early part of their experience. This, they believed, without substantiating evidence, to be due to the patients' fear that the physician's knowledge of their financial circumstances might in some way adversely affect their care in the wards. A few graduates thought that the difficulty in securing accurate information was due to the patient's pride or his desire to conceal his economic state. Undoubtedly, practice in interviewing increased their skill, since the graduates who found this a problem at first stated that it became less difficult with experience.

3. Values to the Patient: All the medical and surgical graduates felt that the plan was of value to the patients. They mentioned the importance of appreciation of the social and economic background of the patient so that their therapeutic procedures and recommendations would be feasible. The patient was considered in terms of his total disability rather than in terms of pathologic lesions. Often asking the patient for social information opened up a general discussion in which the patient revealed emotional conflicts and their causes. It made possible a better handling of convalescence and the care of chronic disease while at home. Adequate after-care was secured for a great many patients who otherwise would have returned to the hospital in similar sick conditions.

Patients benefited by the interns' increased realization of the social implications. This was particularly true of those interns who had not been exposed either by their own personal experiences or by observation to the effect of low economic status, environment and adverse relationships on people. The patients appreciated the hospital's interest which extended beyond the period of hospitalization.

4. Values to the Hospital: All the medical and surgical graduates felt that the plan was of distinct value to the hospital. An adequate plan for after-care frequently reduced the period of hospitalization and eliminated unnecessary readmissions, thus assisting the hospital in maintaining its status as an institution for the care of acute illness and in rendering maximum service to the community.

5. Values to Graduates During Their Period of Training: All the medical men believed that it had value for them during the period of their training in the wards. All the surgical graduates felt that it had value to them excepting one,

TABLE 2.—*Present Medical School Teaching Affiliations*

Medical School	Medical Graduates	Surgical Graduates
Harvard	12	4
Tufts	1	3
Western Reserve	1	
Albany	1	
Yale	1	
Harvard and Tufts	2	
Cornell	1	
Emory		1
Total	19	8

and he wasn't sure. The typical replies from all the graduates indicated that this experience increased their understanding of the patient, that it removed the "case" attitude; that it was a valuable adjunct in the handling of patients not obtainable from textbooks or lectures. It taught them how to plan the care of patients following hospitalization which had not been included in their training up to that time and gave them a long-term view of every patient's

illness. It gave an excellent background for evaluating the factor of the human and environmental equation in the causation, aggravation and recrudescence of functional and organic symptoms. It tended to establish a closer interest in the patient as an individual, enabling the

TABLE 3.—Present Geographic Location of Graduates

State	Medical Graduates	Surgical Graduates
Massachusetts	23	12
New York	3	1
Ohio	2	
Illinois	1	
California	1	
Connecticut	2	
Missouri	1	1
Rhode Island	1	1
Florida		1
Washington, D. C.		1
Georgia		1
Pennsylvania		1
Total	34	19

intern to learn more from each problem, and at times gave the clue to the diagnosis in psychoneurosis and in other personality problems. Also recommendations which were impossible for the patients to carry out were eliminated. Various types of after-care were learned and the difficulties encountered in arranging for them.

6. Values of the Experience to Graduates in Their Private Practice: All the graduates expressed the view that a greater understanding of the patients resulted from the experience. Also, it "developed the human touch appreciated by patients" and emphasized the great part economic factors may play in illness and in the recovery from illness. By acquiring a greater understanding of the patient, some of the graduates believed that they had been rewarded both by a broadened experience and by a greater financial return.

7. Method by Which Graduates Bring into Their Teaching Their Consideration of the Patient: Among the replies from medical graduates now engaged in teaching medical students were included the following methods: Insistence on complete social data for better understanding of the presenting symptoms and intelligent treatment; consideration of disposition of the patient as active therapy not as a finale to a temporary episode; the need for knowledge of the patient and his environment so that plans for disposition will be "feasible, adaptable and profitable."

One of the graduates wrote:

In my third year teaching on the medical wards in the afternoon, several patients with the same diagnosis are discussed. The social aspects are considered, not as a separate entity but as part of the patient's history. When a patient's history is taken, he is not first asked about his pain, but what he does and how he lives. As the patient's history reveals economic insufficiency or unemployment or strain, then the students are told about the failure of medical therapy alone in given cases where these social elements are an important

factor. For example, in a patient with a gastric ulcer, the unmet need for special diet, or family troubles may prevent the medical treatment from becoming effective. As some of the patients are taken up several times, the students then see that their fancy therapy doesn't work.

8. Changes Recommended and Comments: Practically no suggestions for change were made excepting that one or two graduates suggested the expansion of the rounds to include the visiting physicians. Several of the graduates associated with other hospitals commented on the greater possibilities for service to patients by the procedure of medical social ward rounds in which they had previously participated and the lack of which they now regretted.

CONTRIBUTION OF THIS PLAN TO PREPARATION OF MEDICAL TEACHERS FOR TEACHING STUDENTS THE SOCIAL ASPECTS OF ILLNESS

During the early years of the use of this plan of training interns both of us were responsible for teaching fourth year medical students the social aspects of illness. However, as the interns and residents graduated and received medical school teaching appointments, a number of them became teachers in the seminars on social aspects of illness to fourth year students of Harvard and Tufts medical schools assigned to Beth Israel Hospital. The schedule for this teaching is so arranged that the graduates responsible for the regular medical teaching in the wards also conduct the conferences for the teaching of the social aspects of illness later the same morning. In both aspects of this teaching, as a result of their earlier training, the graduates quite naturally and without conscious effort discuss the patient's illness in terms of the particular patient's individuality. The medical social author of this paper has participated in all special conferences on the social aspects and has been greatly impressed by the understanding and enthusiasm which these physicians have brought to this teaching.

In addition to the number who have taught fourth year students, there are other graduates who are assigned to medical teaching for second and third year students. The third year students at the Beth Israel Hospital work in the medical clinic of the outpatient department, where for the first time they take histories, examine patients, make diagnoses and suggest treatment. The Beth Israel graduates who serve as instructors put considerable emphasis on a comprehensive history, stressing the relationship of the social and personal items in the history to the past and present illness and physical examination. As the instructor senses a social component which has bearing on the health situation, he discusses this with the students himself. When the patients present complex social problems or situations which require social assistance, the instructor suggests that

the student take the problem up directly with the medical social worker. She may elaborate on the less obvious social implications of the problem at the time the patient is referred to her. Later, after she has studied the situation and given some case work service, she will report her observations to the student and the instructor. At times this presents an occasion for discussion of broad questions of social import in relation to illness. All of this is carried on informally and as naturally as the student is taught the use of laboratory aids to diagnosis.

It is believed that the training which the intern receives in medical social ward rounds offers a logical opportunity for preparing potential medical instructors for their future responsibilities.

SUMMARY

Medical social ward rounds, as carried on at the Beth Israel Hospital, constitute a regular part of the official duties of the senior intern, resident and medical social ward worker.

As a tested practice over a period of ten years, the plan has been evaluated by the authors and all fifty-three graduates who have participated in the procedure during this time. Of the fifty-three graduates from "straight" internships or residencies, thirty-four were medical and nineteen were surgical. They are located in twelve states. Twenty-seven graduates are teaching in seven medical schools, nineteen medical graduates in five schools and eight surgical graduates in three schools.

Principal among the special features of the plan are:

(a) The responsibility placed on the intern himself to secure a comprehensive knowledge of the patient's social as well as his physical history, so that he may be able to think of the patient in terms of his totality. This replaces the more usual hospital practice in which the social worker takes the responsibility for securing social data.

(b) A review by the intern with the resident and medical social ward worker of the data he has learned, considering each sick person in terms of his own personality and environment.

(c) Discussion by the medical social worker with intern and resident concerning significant social implications unrecognized or unappreciated by the intern to which the trained experienced medical social worker contributes insight and understanding. This aims to broaden his view to consideration of illness and disability beyond the more limited concept of diagnosis and disease.

(d) Sharing by the intern with the medical social worker in the selection of patients with complex social or emotional problems requiring further social study and treatment by medi-

cal social workers or community workers equipped to provide other specialized services.

(e) Sharing with the medical social worker in planning for care of the patient following hospitalization. This furthers his understanding of obstacles within the patient or his surroundings which may arise to prevent or delay execution of both simple and complex recommendations for treatment. From this cumulative experience with a large number of patients, he derives a broad knowledge of community life and its resources or lack of resources for health and social welfare.

The experience derived from medical social ward rounds has been of great value to most of the graduates as a preparation for the realities of private practice.

It has provided an unusual opportunity for the preparation of physicians for teaching medical students.

Recognition is given to the periodic change of service of interns and residents in a teaching hospital. The emphasis must be kept on the training or educational aspects of this procedure. Once initiated and developed, this plan cannot be left to progress by itself as a tradition. It must be recreated anew with each new resident, intern and medical social worker. Therefore, the maintenance of medical social ward rounds as a service and as a training opportunity requires the enthusiasm and sustaining interest of physicians and surgeons of senior rank and of the director of the social service department.

In the ten years of the development and maintenance of this procedure, difficulties were encountered. Most of these were overcome through increased experience and professional maturity on the part of the participants. Therefore, it is believed that teaching interns the social aspects of illness by medical social ward rounds has proved to be a valid method. Further use of the method will develop deeper understanding of the problems involved and may indicate adaptations which will enhance its value.

Unpleasant Facts.—There are unpleasant facts which, as physicians, we are compelled to tell patients and their families, and it is my feeling that when the occasion arises they should be told gently, yet frankly and honestly; time should be taken to make all necessary explanations and to allow for whatever reactions may ensue to subside. One should assume the position of the recipient and should conduct himself with patience, sympathy and tact. Indeed, it would probably be excellent training for every physician if at an early period in his career he could be a patient himself, with a fairly major condition, and in this way obtain the viewpoint of the "other side." Obviously, it would be impossible for every physician who is specializing to be a patient in his own specialty but, on the other hand, this is not necessary, for the essentials of physician-patient relationship are constant in all branches of medicine and the desired end would be obtained.—Douglass, Louis H.: *The Patient*, Bull. School Med., Univ. Maryland, July 1941.

Digests and Reviews

A MEDICAL STUDENT'S VIEW OF THE FUTURE OF MEDICAL EDUCATION

Prepared by Donald McDonald, B.A., of Oxford, at the request of the British Medical Journal and published in that periodical Sept. 6, 1941. The following version is slightly condensed.

In the past the wider problems of medicine have been the hobby of more or less eminent members of the profession who are now retired. Today, sudden and violent change has become such a part of our daily life that every one takes note, and the future has become the vital concern of every one. As a sign of this, meetings of medical students from schools all over Britain, which were unknown ten years ago, this year gathered almost three hundred students at Cambridge, organized as the British Medical Students' Association. They discussed problems in every sphere of medicine; but, because the student of today is the doctor who will have to solve these problems tomorrow, and because the education he receives will make or mar his success, medical education was held to be the most important link in the chain of medical planning.

The first and yet most vital problem is the actual entry into the medical school. No one can doubt that the present methods of selecting medical students are haphazard. A father's sentimentality, a desire for a safe job, almost any reason except a desire to serve the community is good enough provided there is enough money for the initial heavy expenditure. Medical schools have to accept such students as a source of income, using a very few scholarships as a means of advertising. The solution clearly must lie with the provision of a vastly increased number of scholarships. Only then can students be chosen because they will make good doctors, which requires temperamental as well as intellectual qualities, and not for any other reason.

THE CURRICULUM

The medical curriculum is long and arduous. This is inevitable because the subject is vast and the doctor needs to be efficient in every branch of it; therefore no one complains about its length. On the other hand, there is much that is useless and irrelevant which needs to be pruned away. The result of this will not be to shorten the whole course but to allow more important subjects to be introduced. The war-time need of getting doctors as quickly as possible introduces an important factor into immediate considerations of the question but will not alter the long-term view of what is felt to be desirable. The premedical course in the

elements of the physical and biologic sciences needs drastic revision, for it is poorly presented, uninformative and a dead weight on the early enthusiasm of the student. Although its aims are praiseworthy it is still planned, as in olden times, for the student who read only classics at school and even possibly took a classical degree before proceeding to medicine. Today that is true of but few, and certainly specialization at school should not be so advanced as to exclude any one's reaching university standard from the elementary knowledge of physics and chemistry that is required. In the meantime the university teaching in these subjects could be much more imaginatively related to their application in medicine. With regard to biology the position is different. A sound understanding of the behavior of living organisms in general is essential for the doctor, but the manner of presenting the subject is not the best. Botany is still based on the needs of the doctor who dealt directly with medicinal herbs. Zoology is planned on the huxleian idea that evolution was in a single line and that the study of lower types will lead directly to an understanding of man. In practice this has led to the student's being required to know details of animals which are the failures, the dead ends, of evolution. Man is the simplest mammalian type and is easier to understand than other species which are highly specialized in one direction. Therefore the comparative anatomy learned at this stage is actually much better introduced with human anatomy. A course in general biology orientated to the special point of view of the doctor is required, and this should include the principles of heredity, the evolution of behavior, which is necessary for an understanding of psychology, and also ecology—the study of animal communities—leading on to sociology. In recognition of the fundamental importance of this course, it should be taught by the best and most mature teachers. A course of this type is given in America and is found to be highly successful. Another plan would be to imitate the American method, in which a general university degree is taken before starting medicine; again the lengthening of the time as a student would be irksome to most.

TECHNICAL TRAINING

Although many criticisms are made of the way in which anatomy and physiology are taught, particularly as the mass of detail to be learned is burdensome, they are not always justified, for the future doctor has to know the details of human anatomy. The important question is to ask whether this essential knowledge is taught in the best way. The

answer is definitely in the negative. In the first place, the two main subjects, anatomy and physiology, are taught as if they bore no relation whatever to each other, with the exception that, by a peculiar English custom, histology lives in the same building as physiology. The geographic separation of the dissecting rooms has created an apparently insuperable obstacle in the relation of structure to function. A little cooperative discussion could surely solve this problem. Anatomy is traditionally learned by mnemonics—which means without the cooperation of the intelligence. To some extent students are to blame, because there are many progressive anatomists who strive against this degradation of their subject. But the students in turn are ruled by the examinations and the unknown quantity of the external examiner, so that progress in an isolated school is extremely difficult. It has already been mentioned in this connection that comparative anatomy illustrates and makes human anatomy more clear, and with this embryology should be included: both these subjects, which introduce a rationale into anatomy, are much neglected in present teaching. This is not a plea for pedanticism but is of real practical importance; for anatomy learned intelligently can never be completely forgotten, as can that learned by rote.

The teaching of physiology is, on the whole, much better but once again suffers from a tendency to cram certain facts without understanding. In this subject the defect is more important, for, while anatomic detail remains the same for successive generations, physiology is advancing at a fast rate. Therefore it is essential, if his medicine is to be based on sound physiology, that the future doctor learn it in a scientific flexible way with an understanding of past developments that will enable him to keep track of its advances in the future. In the past only Oxford and Cambridge have specifically set out to do this, and they allocated a year to take an honors course in animal physiology. It was popular in spite of the extra year required, which means that its value was appreciated by the students. Now, in the interests of war, this course has been omitted; but in the future its example should be taken heed of, if not in the formal sense of a year's course at least in the way that physiology is taught. In addition to the intellectual approach the course provided excellent technical practice, of which the best was in mammalian physiology, for this is the only chance students get of handling living material before they have to deal with patients on the operating table.

The teaching of structure and function together is an obvious need. Equally essential is the comparison of the diseased with the

normal. While the student cannot do every subject at once, it must be remembered that the preclinical subjects are taught for use in clinical medicine, so that the introduction of clinical material early in the course illustrates and gives direction to the learning of anatomy and physiology. Study of the nervous system is the outstanding example in which function and anatomy need to be taught together and then directly applied to the neurologic case. Instead of this, each part is taught independently, in different places, at different periods, with a great amount of repetition which is a waste of time.

CLINICAL TEACHING

In clinical teaching the most frequent criticisms are directed against rather different objects. This is because the whole environment changes from an academic to a professional one. The student is told that the objects of his studies are, first, diagnosis; second, diagnosis, and, third, again diagnosis! But the student, while never denying its importance, wonders if this is quite enough. Has he really done all that he can if he listens to a tuberculous lung for six months and then, having diagnosed a healing condition, sends the patient back to the slums he came from? Is it really sufficient to study 10 cases of children with rheumatic heart disease without observing that they all come from a district with notoriously damp housing? No, it is not enough; and the fact that students in conference bring such criticism up again and again shows that they feel frustrated by the present scope of their teaching. The teaching of preventive medicine is a widespread and urgent demand which is neglected almost everywhere. Public health lectures, as given at present, deal with the legal aspects of sanitation and no more.

The great majority of students are going to be general practitioners, forming the vanguard of any advance to improved health for the community the profession is going to make. On them will rest the responsibility of diagnosing disease early. Yet the material they are taught with is still almost entirely "interesting" cases of rare diseases or with advanced physical signs. This has some justification, for the specialist naturally collects cases in his own specialty, and the loudest murmur is the one for the beginner to listen to. On the other hand, the senior student who has learned to recognize physical signs can apply his knowledge in clinics, which is the nearest thing to general practice that hospitals provide. Outpatient clinics are fairly good for this purpose if they are not overcrowded, but municipal clinics that some London students go to are better, and the dispensary system in Scotland probably best of all.

THE MILDLY NEUROTIC PATIENT

Another major problem in general practice is the maladjusted, possibly mildly neurotic, patient. A field in which a great deal of good can be done, it is almost entirely neglected by present day medical education. Psychology consists of a few lectures in the major psychoses, illustrated by the most amusing inmates that the mental hospital can produce. This is a most important omission that can and should be rectified. Also in general practice in industrial centers diseases due to working conditions and industrial processes are constantly being met, yet training in recognizing them is confined to possibly two lectures in a public health course. In all these ways could medical education be more closely related to the needs of the doctor after qualifying.

TEACHING UNITS ARE TOO LARGE

The manner in which teaching is carried out falls short of the ideal. Units tend to be much too large for the best results, as, particularly in the wards, the information does not reach many of the listeners, and there is no opportunity at all of asking questions or taking part in discussion. Lectures are often compulsory, in which case the student is denied even the simple criticism of stopping away, and the lectures may become slovenly as a result. Reading from textbooks has been redundant since the invention of printing. During the last two years, when many schools have been evacuated, it has been found that the formation of seminar groups between teacher and students, with free discussion, has led to the most successful results. At the same time the ability to criticize lecturers has resulted in improvements. Thus the formation of staff-student groups to discuss the organizational problems in a school is found to be effective from all points of view, revolutionary though it may seem. The other alternative suggestion is that the staff of a medical school should have had a pedagogic training or at least be chosen for teaching ability rather than for research. Many feel, however, that this would kill any scientific life in the teaching through replacing scientists by orators, for if the research worker is good he will have such a clear idea of his subject that he cannot talk badly about it. The way forward shown by helpful mutual criticism between teachers and taught seems to be by far the most promising.

The provision of smaller teaching units also enables students to get far more practical experience of the various techniques, such as lumbar puncture and intravenous infusions, that he will need to be able to do as a doctor. Opportunity for this varies greatly in various medical schools, and it cannot be doubted that the complete divorcement of the student from practical work is very bad. On the other hand

there is often required a tremendous amount of attendance at operations which in fact can demonstrate nothing to those more than a yard from the operative site. Perhaps most important of all is training in casualty work, for minor surgery plays a large part in a practicing doctor's life. The aerial warfare of today makes it doubly important; in fact, the teaching of this subject has been greatly extended since the beginning of the war, but there is doubtless still room for improvement in some places.

CONCLUSION

A great many of the points mentioned can be easily changed by local adjustment, and usually the members of the staff are very willing to accept suggestions for improvement. Broadly, however, the aims of medical teaching can only be altered so that they fulfil the needs of the doctor and enable him to serve the community to the best of his ability, on a national scale. The British Medical Students' Association is going to present, by invitation, a memorandum to the Planning Commission set up by the British Medical Association, and by this means it is hoped that the necessary changes will be effected.

THE ORIGIN AND PURPORT OF UNIVERSITIES

Condensation of the introduction to an address by Sir Walter Langdon-Brown before the Royal College of Physicians of Ireland and published in the Irish Journal of Medical Science, September 1940.

When barbarian waves of Germanic tribes and hordes from the Russian steppes threatened the last civilization as they are menacing this, it tottered, crumbled and fell like a child's sand castle before the incoming tide. Amid the shifting sands two outposts of that civilization still stood as if founded on the rock, Ravenna and Constantinople. From those two centers a new civilization began slowly to radiate. Ravenna helped to humanize the Goths, while Constantinople was the great repository of ancient learning. Considering the difficulties of transport, an astonishing thing about the Middle Ages is the degree of mobility displayed by those thirsting for the scant opportunities of acquiring any kind of education. The wandering scholars flocked hither and thither according as the reputation of some teacher waxed or waned. Where the man was, there was the school. The word universitas originally signified a guild formed for self protection either by the teachers or by the students. They needed these powers of combination, for they were strangers in a strange land. The feuds of town and gown were innate in the system, for the towns hated the students and yet were dependent on the money they brought. The universities claimed extraterritorial rights and privileges and gradu-

ally extended jurisdiction over the town. Here were inevitable sources of conflict. At this stage the university was an intangible affair, a thing of the spirit.

Even today in some respects at Oxford and Cambridge, the university itself is intangible. What would happen if a stranger arriving at Cambridge station were to tell a taxi driver to drive him to the university? As well might you arrive at Euston and ask to be driven to the British Constitution. How much more intangible was a university when it had no buildings and no endowments, when it was just the guilds of masters and pupils free to wander off if insulted by the townsfolk? This placed a powerful weapon in their hands; they could close down and journey to a more hospitable city with no more than their knapsacks, leaving financial disaster behind them. This weapon was repeatedly used with serious consequences until 1499, when King Louis XII and his parlia-

ment forbade the cessation of the University of Paris and won the day.

Paris and Bologna were the two most ancient universities. When the earliest universities arose, Germany was too far behind the rest of Europe in culture and civilization for the simultaneous development of a university. The first to be founded was Prague. In one day Prague was forsaken by the vast horde of German students who had been attracted there by policy of the Bohemian sovereign. Teuton and Czech could not live together in the same schools. It has been asserted this was the starting point of that long enmity between Catholic and Teuton which has culminated in a conflagration today. When the University of Berlin was subsequently founded, its charter declared that it should be unattached to any creed or school of thought. However, at present the head of its medical school is a Nazi official who is even medically qualified.

DO YOU KNOW WHAT PHYSICIAN—

1. Is known as the father of anatomy?
2. Later became a foremost comedian on the stage?
3. Was the greatest anatomist of his time but yet failed in his examination in anatomy to be marked "excellent"? (The answers are on page 18)

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items for consideration for publication in the Student Section.

Course on "Treatment of Patients as Persons"

The freshman class at Harvard Medical School, Boston, had an unusual introduction to the study of medicine this fall when at one of their first lectures Dr. Charles S. Burwell, dean and research professor of clinical medicine, presented to the class a case of mitral stenosis with thyrotoxicosis and failure, complicated by social and personal problems, anemia and other complexities. The lesson in this demonstration was that physicians should have more insight into the understanding of such cases than the factual knowledge that they gain in school. These clinics for freshmen will be continued by Dr. L. J. Henderson and others as a voluntary course on "The Study and Treatment of Patients as Persons." Harvard is thus meeting a need recognized by the late Dr. Francis W. Peabody, formerly professor of medicine at Harvard, in an address before the medical students and published in *THE JOURNAL*, March 19, 1927, page 877.

Pennsylvania Seniors Returned Early

In consideration of the national defense program, the senior students at the University of Pennsylvania School of Medicine, Philadelphia, came back to their classes three weeks earlier this fall in order to complete the course on or before May 1. The freshman class at Pennsylvania is the largest in many years, comprising 129 students, representing seventy different colleges. The freshman class has been the first to adopt the newly constituted honor system under the control of the Student Board of Ethical Relations. The other classes have not yet voted on the system.

Expansion of University of Texas School of Medicine

The great expansion program which the medical branch of the University of Texas is undergoing is outlined by the president of the university, Horace Price Rainey, Ph.D., at the opening of the school of medicine in Galveston, October 1. Dr. Rainey's address was broadcast throughout Texas. Every department in the medical college is adding new members to staff and new courses are being made available, including courses in cardiology, biophysics, cell physiology, bacteriology, advanced anatomy and pharmacology. The research program also is being expanded. Plans are now complete for a new hospital building. The summer session of the quarter system at the school which was inaugurated last summer in order to assist in the country's defense program, proved highly successful. The students generally favor this plan, which allows them to go to school through the summer and thus graduate one year earlier.

First Assembly at Cornell

The largest enrolment in the history of Cornell University Medical College, New York, a total of 375 students, it is reported, assembled for the first time September 16 and were addressed by Dr. Samuel Levine, professor of pediatrics. Dr. Levine stated according to the *New York Times*, that the doctor must study not only the technic of healing if he is to take the leadership in the health program but also such social factors as nutrition, clothing, housing, etc.

ily income, educational and employment conditions; such preparation, he declared, "is either lacking or wholly inadequate in present-day medical education." The assistant dean, Dayton J. Edwards, Ph.D., awarded the following prizes: Walter F. Riker, a senior, first prize under the William Mecklenburg Polk Award for efficiency in research. John Langdon Norris, a junior, second prize.

Five scholarships amounting to \$700 each, established under the will of Dr. John Alfred Heim of the class of 1905, were awarded to Leyland E. Stevens, Henry Tesluk, Bruce M. Esplin, Morris O. Locks and William T. Mosenenthal.

Other scholarships were awarded to John B. Pfeiffer, Franklin Robinson, Francis S. Greenspan, Roy C. Swan Jr., Rosemary V. Gorman, Cedric C. Jimerson, Richard E. Kobilak, John H. Stover Jr. and George G. Reader.

The present first year class of 84 students at Cornell was selected from 1,070 applicants representing one hundred and eighty-five different institutions.

Michigan Awards the Sternberg Medal

At a special convocation of the University of Michigan Medical School, Ann Arbor, during the second triennial medical alumni reunion, the honorary degree of master of science was awarded to Dr. Warren T. Vaughan of Richmond, Va., and the Sternberg Memorial Medal was awarded to Dr. Cris J. Zarafonitis of Grand Rapids. Dr. Zarafonitis graduated from the medical school last June and is now an intern in the Boston City Hospital. The Sternberg medal was established by the University of Michigan Medical School in 1921 in honor of the late Dr. George M. Sternberg, a widely known bacteriologist and formerly surgeon general of the U. S. Army. The medal is awarded annually to the student who has the best record in the subject of preventive medicine. Dr. Vaughan is the son of the late Dr. Victor C. Vaughan, who was dean of the University of Michigan Medical School from 1891 to 1921.

Jefferson

Jefferson Medical College of Philadelphia opened its one hundred and seventeenth annual session September 17 with a lecture by Dr. Martin E. Rehfuss, professor of clinical medicine, on "The Medical Student of Today." The seventeenth dean of the college, Dr. William H. Perkins, was presented, and the announcement was made of his appointment also as professor of preventive medicine. The freshman class comprises 141 students, all of whom had received a bachelor's degree after four years of college work in one of sixty-six different institutions. The student body geographically represents twenty-nine states and two insular possessions.

Tennessee Chapter of A. O. A.

The Beta chapter of Tennessee of Alpha Omega Alpha national honorary medical society was installed at the University of Tennessee College of Medicine, Memphis, October 24. Orren W. Hyman, Ph.D., dean of the college of medicine, presided over the ceremony and accepted the chapter into the school. The honor was conferred by Dr. Walter L. Biering, of Iowa, a former president of the American Medical Association and now national president of Alpha Omega Alpha. The ceremony was attended by many guests, including the mayor of the city of Memphis, members of the board of trustees of the University of Tennessee and representatives of a number of other universities and colleges of medicine.

The certificates and keys were presented to the initiates by the national secretary of Alpha Omega Alpha, and responses were made by James D. Hoskins, LL.D., president of the University of Tennessee, Dr. Frank L. Roberts of the faculty of medicine and Dr. James B. Stanford. The charge to the new chapter was delivered by Dr. Waller S. Leathers, dean of Vanderbilt University School of Medicine. The student initiates were Edwin W. Couch, James N. Etteldorf, Noble O. Fowler Jr., Mary I. Griffith, Jim G. Hendrick, Milton M. Liebeskind, Russell H. Patterson Jr., Mary E. Plummer, William E. Sheffield and Ellison F. White Jr. The faculty initiates were Dr. Lathan A. Crandall Jr., professor of physiology; Dr. Lemuel W. Diggs, associate professor of medicine; Dr. Raphael E. Semmes, professor of neurosurgery, and Dr. James S. Speed, professor of orthopedic surgery.

Columbia

At the opening exercises of Columbia University College of Physicians and Surgeons, New York, September 24, Nicholas Murray Butler, Ph.D., president of Columbia University, gave the address of welcome and Dr. Harry S. Mustard, director of the DeLamar Institute of Public Health, gave an address on "The Nation's Health." The freshman class at Columbia comprises 125 students from thirty different states. One hundred and three students received scholarship aid for the current year, totaling more than \$37,000. Twenty of these scholarships were to out of town students to cover living expenses at Bard Hall, the medical student dormitory.

The Smith-Reed-Russell Society at George Washington University

This society at George Washington University School of Medicine, Washington, D. C., is named in honor of Dr. Theobald Smith, Major Walter Reed and Brig. General Frederick F. Russell, M. R. C., all former professors of bacteriology at this medical school. The organization has planned a series of monthly lectures, the first of which was delivered at the school of medicine, October 18, by Dr. Walter B. Cannon, professor of physiology, Harvard Medical School, Boston, on "The Effects of Emotions on the Body." The second address of the series was presented, November 5, by Dr. Esmond R. Long of the Henry Phipps Institute, University of Pennsylvania, Philadelphia, on "The Control of Tuberculosis as a Public Health Problem."

The newly elected officers of the Smith-Reed-Russell Society are Gilbert I. Anderson '42, president; Leo H. Siegel '43, vice president, and Sally L. Steele '43, secretary.

Lecture on History of Medicine at Tulane

The History of Medicine Society at Tulane University of Louisiana School of Medicine, New Orleans, is sponsoring a series of lectures to be held throughout the year, the first of which was delivered November 7 at Hutchinson Memorial Hall by Dr. Willard R. Wirth, associate in charge of the cardiac station at Touro Infirmary, on "The History of Cardiology." In December Dr. Conrad G. Collins, associate professor of gynecology and obstetrics, will speak on the history of childbed fever; in January Dr. Ambrose H. Storck, assistant professor of surgery, will speak on the army surgeon, and in February Dr. Julius Lane Wilson, associate professor of medicine, will speak on the history of tuberculosis. The public is invited to these lectures.

The Mann Lectureship at Indiana

Invitations were issued by the faculty of the Indiana University School of Medicine, Indianapolis, to attend the first lecture of the Frank C. Mann Lectureship, November 18, in applied physiology, supported by the Phi Beta Pi fraternity of Indiana University. The speaker was Dr. Frank C. Mann, Rochester, Minn., professor of pathology and experimental physiology and surgery, University of Minnesota Graduate School, and his subject was "The Circulation of the Liver." Dr. Mann was the author also of the leading article in THE JOURNAL, November 8 entitled "The Liver and Medical Progress."

West Virginia

The annual Phi Beta Pi lecture at West Virginia University School of Medicine, Morgantown, was delivered on April 17 by Dr. Howard T. Phillips of Wheeling on the subject of cutaneous diseases. The lecture was attended by medical students, premedical students and faculty. George S. Appleby '41 and Walter J. Glenn Jr. '41 served on the student executive committee for the occasion.

Illinois

The University of Illinois College of Medicine chapter of Alpha Omega Alpha national honorary medical society in Chicago announces the election to membership of the following members of the junior class: Charles E. Klontz Jr., Leonard Stone, Doris Clare Grosskreutz, George Bernard Golinkin Jr., Seymour Robert Cohen and Walter Kenneth Robinson.

Prizes Awarded at Jefferson

The following prizes, among others, were awarded by Jefferson Medical College of Philadelphia at the commencement June 6:

Laryngology Prize. By Professor Clerf, \$25 for general excellence in laryngology and bronchoscopy, to Frederick Alexander Robinson Jr., with Honorable Mention of Charles Nicholas Burns.

Neurology Prize. By Professor Alpers, \$25 for the best examination in neurology, to John U. Fehr.

Psychiatry Prize. By Clinical Professor Keyes, \$25 for the best examination in psychiatry, to Frederick Alexander Robinson Jr., with Honorable Mention of Hubert Horace Washburn.

Orthopedic Surgery Prize. By Professor Martin, \$25 for general excellence in orthopedic surgery, to Joseph Benjamin Crawford, with Honorable Mention of Frederick Balthas Wagner Jr.

Therapeutics Prize. A gold medal for the best examination in therapeutics, to Earl William Schafer Jr., with Honorable Mention of Joseph Benjamin Crawford.

The Pascal Brooke Bland Memorial Prize of \$25, given by Mrs. J. Hamilton Coulter in memory of her father, to the senior student who has shown the greatest aptitude and excellence in practical obstetrics, the student to be chosen by the professor of obstetrics and the money to be used exclusively for the purchase of medical books, the choice of which is to be left to the discretion of the student who receives the award, and the purchase of which is to be made through the librarian of the college, to Frederick Balthas Wagner Jr.

W. B. Saunders Company Prize. Seventy-five dollars' worth of their medical publications to the student who passes the best general examination at the end of the senior year, to Joseph Benjamin Crawford.

William Potter Memorial Prize. The income from a bequest of Mrs. Adaline Potter Wear, not exceeding \$250, offered to encourage excellence in the clinical branches of medicine and awarded to that graduate attaining the highest general average in the final two years of the medical course, to Frederick Balthas Wagner Jr.

Alumni Prize. By the alumni association, a medal for the best general average gained in the examinations for the entire curriculum, to Frederick Balthas Wagner Jr.

Physiology Prize. A gold medal awarded by bequest of Dr. Francis W. Shain for the best essay, or the best examination, on a subject pertaining to physiology (open to undergraduates of the second year), to Warren Reichert Lang '43, with Honorable Mention of Frank Clark '43.

Anatomy Prize. A gold medal, awarded on the completion of the sophomore year, to the student who has the highest grade in the anatomic subjects of the freshman and sophomore years, to Warren Reichert Lang '43, with Honorable Mention of Henry Harr Alderfer '43 and Paul Aloysious Ladden '43.

D. Appleton-Century Company Prize. Fifty dollars' worth of their medical publications to the student who passes the best general examination at the end of the junior year, to Paul Kram Perilstein '42.

Schaeffer Anatomic League Prize. A gold medal awarded to Professor Schaeffer to the member of the league presenting the best thesis in the science of anatomy, including embryology, histology and comparative anatomy, to William Henry White III '43, with Honorable Mention of Rhinard DeLancey Parry '41.

"DO YOU KNOW WHAT PHYSICIAN"

Following are answers to the questions appearing on page 1828:

1. Vesalius (1514-1564), who was the first to put dissection on a scientific basis. Vesalius, who was a student of Galen, drifted away from the traditions and superstitions of the time. Although retaining Galen's theory of separate venous and arterial circulations Vesalius described the internal anatomy of the heart in a way which anticipated more recent work in this line. After years of study and teaching at Padua he published his great work "De Fabrica Humani Corporis," which instituted a new era in the history of the physician. Vesalius, according to Bishop and Neilson, suffered the usual contempt and abuse for his radical departure. He retorted by destroying his available manuscripts, left Padua and deserted anatomy. A pretext for getting rid of this skillful anatomist, who was regarded dangerous by the Inquisition, was found in accusing him of having opened the body of a living man. He was sent to the Holy Land on a pilgrimage of penitence, and on his return journey he perished on the island of Zante, after having been shipwrecked.

2. Charles Wyndham (1841-1919). Sir Charles was born in Liverpool, the son of a physician. He qualified in medicine at the Royal College of Surgeons and the Society of Apothecaries and also graduated M.D. at Giessen by examination. He served as a surgeon in the federal army in the American Civil War and at times during that period appeared on the New York stage. He returned to England in 1865 and gained foremost place as a comedian. King Edward in 1900 conferred on him the honor of knighthood.

3. Dr. Jacob Henle (1809-1885), who graduated in medicine from the University of Bonn in 1832. In 1840 he became professor of anatomy and physiology at the University of Zurich, Switzerland, and from 1844 to 1852 he was professor of anatomy at the University of Heidelberg. His final examinations in anatomy at Bonn were given by Professor Schlemm, who gave him the mark "Good." Henle wrote to his father about this, expressing his keen disappointment and surprise. Henle's contributions to medical science were epochal. Garrison said that his histologic discoveries take rank with the anatomic discoveries of Vesalius. His name is found on the following parts of the body: trachoma glands of Henle, Henle's membrane (the lamina bursalis), Henle's fibrous layer, Henle's stratum nerveum, Henle's warts, Henle's layer (of the hair follicle), Henle's spine, Henle's ligament, Henle's fenestrated membrane, Henle's ampulla, the canal of Henle (the portion of the uriniferous tubule), Henle's cells, Henle's fibrin, Henle's internal cremaster, Henle's sphincter and Henle's loop, which he covered by injection. His greatest work, "Cernel Anatomy," was published in 1841 while he was at 310 in Zurich. During his years at Heidelberg time completed his main contribution to pathology, "book of Rational Pathology." During his years at tingen he produced his monumental work "doctor of Systematic Anatomy," which was followed by an Atlas a few years later, in which the excellent illustrations were reproductions of his own drawings.

Book Notices

Fractures and Other Bone and Joint Injuries. By R. Watson-Jones, B.Sc., M.Ch. Orth., F.R.C.S., *Civilian Consultant in Orthopedic Surgery of the Royal Air Force.* Second edition. Cloth. Price, \$13.50. Pp. 724, with 1,040 illustrations. Baltimore: William Wood & Company, 1941.

Following so quickly on the first appearance of Watson-Jones's book on "Fractures and Other Bone and Joint Injuries" (Baltimore, Williams and Wilkins Company, 1940), this edition offers few changes. In part I, chapter x, on the open and infected fractures of war wounds, there is added a short but excellent discussion on the limitations of antiseptic therapy, and we note with satisfaction that he considers antiseptics both useless and painful if applied to a wound day after day. There is also added to this chapter a short discussion on first aid (Thomas splint) and treatment of primary shock, wound shock and hemorrhage. Then there is also the distinction of wound treatment within the first twenty-four hours and that later than that, which seems to be a useful addition. Chemotherapy has found a short discussion on the action and complications of the sulfonamide derivatives and there is a short but practical paragraph on emergency amputations. The chapters that follow have remained essentially unchanged, with minor additions such as the use of a sliding bed with balanced traction in fracture of the femur (chapter xxxix) and a slight reclassification of the avulsions of the epiphysis of the tibial tubercle (chapter xxx). The work on the whole goes far beyond the usual territory covered in books on fractures and dislocations by including all traumatic situations, sprains and muscular injuries. Its principal virtue is the extreme thoroughness with which this field is covered in all details. The presentation is superb, the illustrations are excellent, the material is complete, the roentgenograms are of the best quality. All in all, it is a book of almost overwhelming thoroughness and practical presentation, attractively and artistically edited.

Hernia. By Alfred H. Inson, B.A., M.D., Consulting Surgeon, Long Beach Hospital, Brooklyn. In Three Sections: *Historical Evolution of Hernial Surgery; Technical; Medico-Legal Aspects.* Cloth. Price, \$15. Pp. 1,325, with 355 illustrations by Alfred Feinberg, Instructor of Medical Illustration, Dept. of Pathology, College of Physicians and Surgeons, New York. Philadelphia: Blakiston Company, 1941.

The text is divided into three sections. Section 1 consists of a chronological history of hernia, dealing principally with the maltreatment of inguinal hernia through the ages. The barbaric practices of the early surgeons are appalling and the variations in herniorrhaphy technic up to the latter part of the nineteenth century are shown to be principally variations in the method of mutilation. The author quotes extensively from early documents and, while the context sometimes wanders from the subject of hernia, it is an excellent historical review and very interesting reading.

Section 2 not only deals with current methods of herniorrhaphy but thoroughly covers the entire scope of the hernial problem as it is understood today. Citations from the literature are multiple and will serve to make this section invaluable as a reference book. This section is divided into a number of parts. Part 1 is a discussion of incidence and biometrics including age, race, occupation and heredity. Multiple tables serve to illustrate further these points. Such factors as the incidence of recurrence, traumatic hernias, complications and associated anomalies are also presented. An encyclopedic classification of hernias according to etiology, morphology, sac contents and clinical terminology is outlined that omits nothing. Next in this section is a presentation of the anatomy of the various hernial sacs. This portion deals with morphology, congenital defects and complications in a thorough manner. The author is to be highly commended for not simply reprinting the subject matter from the textbooks. He not only presents the standard descriptions but has condensed the recent additions to the anatomic knowledge. It is apparent from reading this section that the study of the hernial regions is not a static subject and that surgeons who base their repairs on nineteenth century knowledge are certainly in error. Part 2 deals with the varie-

ties, etiology, constituents, signs, symptoms, diagnosis and differential diagnosis of inguinal hernias. There is some repetition of previously presented subject matter, but on the whole it makes for clarity. Part 3 is concerned with the nonoperative treatment of inguinal hernias, including prophylaxis, palliation, the truss and the injection treatment. The preoperative preparation of the patient is a presentation of sound general surgical principles. Part 4 deals with the indications, contraindications and the various operations for reducible inguinal hernias. The many standard operations are presented. For each the objective is stated and followed by a description of the technic. The more popular operations are accompanied by adequate illustrations. Part 5 treats the subject of femoral hernia from definition to the various operations in the same thorough manner in which inguinal hernia is presented. Part 6 discusses the preoperative and postoperative complications of inguinal and femoral hernias and their treatment. The remaining parts of this section deal with umbilical, ventral, incisional and other less common hernias in a degree commensurate with their frequency. Again the more common operations are adequately illustrated.

Section 3 discusses the highly important subject of compensable hernia with its varied medicolegal aspects. The workmen's compensation laws in the forty-eight states and in foreign countries are presented.

This excellent textbook, encyclopedic in its scope, fills a definite need in the confusing and complex subject of hernia. It is exceptionally well written in a lucid style, well illustrated and unconditionally recommended to all who are interested in the subject of hernia.

Chemical Analysis: A Series of Monographs on Analytical Chemistry and Its Applications. Editorial Board: Beverly L. Clarke, J. M. Kolthoff, and Hobart H. Willard. Volume I: *The Analytical Chemistry of Industrial Poisons, Hazards and Solvents.* By Morris B. Jacobs, Ph.D. Cloth. Price, \$7. Pp. 661, with 110 illustrations. New York: Interscience Publishers, Inc., 1941.

This volume introduces the first of a series of monographs on analytic chemistry and its applications. The rapidly expanding literature on industrial hygiene attests the growing need for a compilation such as the present book; a collection into one volume of information about the numerous hazards and poisons with which the industrial hygiene chemist is concerned and the methods developed for their detection, sampling and quantitative determination. The scope of the book is indicated by a survey of the numerous chapters, which include industrial hygiene and industrial poisons, sampling, measurement of gas volume and quantity, absorbers and absorbents, the chemical and microscopic estimation of dust and silica, dangerous metals, the common poisonous compounds of sulfur, phosphorus, nitrogen and halogens, carbon monoxide, carbon dioxide, hydrocyanic acid and cyanogen, combustible solvent vapors, paraffin and unsaturated hydrocarbons, benzene and the aromatic hydrocarbons, halogenated hydrocarbons, alcohols, glycols, alcohol-ethers and ethers, acids, esters, aldehydes and ketones, phenolic compounds, aniline and derivatives, and chemical warfare agents. The numerous references to the original literature and the explanatory material given throughout the text make the volume a concise reference textbook as well as a convenient laboratory manual. A number of useful tables have been placed in the appendix. The author, well qualified by virtue of long contact with this field of chemistry, has adequately surveyed the tremendously large field of industrial hygiene and has presented in a clear manner a wealth of information useful both to the chemist and to organizations and individuals concerned with industrial hazards prevention.

The Occurrence and Prevention of Occupational Diseases Among Women, 1935 to 1938. By Margaret T. Mettert. United States Department of Labor, Women's Bureau. Bulletin of the Women's Bureau, No. 181. Paper. Price, 10 cents. Pp. 46, with 3 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

Nine state agencies furnished information for this report on the number of women injured by occupational disease—Connecticut, Illinois, Massachusetts, Michigan, Minnesota, Missouri, New York, Ohio and Wisconsin. The study included dry cleaning and nursing and the manufacture of pottery, asbestos, shoes and wood heels. Disabilities of women usually were of a tem-

porary nature. However, in one of the four states giving this type of information 12 of 63 women reported in 1938 suffered injury of a permanent character, and in two states fatalities were reported. Dermatoses were the most common type of disease reported of men and women in each state and comprised a higher percentage of the women's total. Dermatoses were followed by disability from repetitive motion, lead poisoning, volatile solvent poisoning, chrome ulceration, respiratory diseases and contagious diseases among nurses, teachers, household employees and hospital attendants. In all states the percentage of women disabled by occupational disease is much greater than the percentage they form of the total injured by other causes. In the various reporting states from 52 to 70 per cent of the women with industrial disease were less than 30 years old, though roughly half the employed women in each state were in such an age group. A marked difference existed between men and women in the proportion of those reported less than 20 years, attributable largely to the fact that youth characterizes employed females more generally than employed males. The evidence points to the need of special efforts toward prevention of disease among young employees. The study included evaluation of exposure to toxics, showing no variation from the already recognized hazards.

A Short History of Psychiatric Achievement with a Forecast for the Future. By Nolan D. C. Lewis, M.D., Professor of Psychiatry, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price, \$3. Pp. 275. New York: W. W. Norton & Company, Inc., 1941.

The content of this book made up the Thomas W. Salmon Memorial Lectures. The book traces the beginnings of modern psychiatry through the Middle Ages and proceeds to modern advances such as those by Pavlov, Freud and his various offshoots and brings us at last into the psychosomatic point of view. The conclusion, which deals with prospects for future achievements, is stimulating to all who are concerned with research in psychiatry. The author tabulates the following main trends of such research:

- (a) The investigation of brain potentials and conduction phenomena in the central nervous system.
- (b) A search for detailed pathologic changes in the brain and other organs.
- (c) The physical and chemical variations in the blood, cerebrospinal fluid and other constituents of the body.
- (d) A study of the chemical equilibrium of the body.
- (e) The precise nature of the instinctive drives and urges.
- (f) The delineation of the elements entering the organization of personality.
- (g) The various patterns of personality reaction, including the disorders and the significance of the human environment in the home, the school, and in economic and other social adjustments.
- (h) The search for any medical and psychologic resources that could be utilized for therapeutic adjustments.

He finds a trend toward an American school of mental hygiene and psychiatry. Psychiatry has passed through the theological and metaphysical stages and has effected a closer affiliation of the whole temper of modern science.

Until the Doctor Comes. By James A. Dolce, M.D., Division of Sanitary Reports and Statistics, Federal Security Agency, United States Public Health Service. Miscellaneous Publication No. 21. Paper. Price, 10 cents. Pp. 60, with 16 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This simple pamphlet can be purchased for a nominal sum from the Superintendent of Documents in Washington, D. C. It represents a straightforward, brief statement on first aid suitable for every home. It makes no attempt at involved medical treatment but mentions merely the simple measures that have had the test of time. Although surgeons are inclined to discount the use of tincture of iodine on wounds, this type of treatment is still supported by this book on first aid. Especially important is the simple advice regarding burns: 1. Do not apply ointments, grease or oils of any kind. 2. Never apply iodine to a burn.

The Keys of the Kingdom. By A. J. Cronin. Cloth. Price, \$2.50. Pp. 344. Boston: Little, Brown & Company, 1941.

Although educated as a physician, a contributor to medical research and a former professor of medicine, Dr. Cronin is best known now as a novelist of distinction. More particularly he is the trained craftsman. Thus "The Keys of the Kingdom," which has to do far more with the priesthood than with the

medical profession, exhibits a beautiful performance of novelist's art. It is well written and has sufficient dramatic climaxes and enough of human interest to place it promptly the best seller class. It was the choice of the Book of the Month Club for August.

The Therapeutics of Internal Diseases. Supervising Editor: G. Blumer, M.A., M.D., David P. Smith Clinical Professor of Medicine, Yale University School of Medicine, New Haven. Associate Editor: Albert J. Sullivan, M.D., Adjunct Clinical Professor of Medicine, Georgetown and Georgetown Medical Schools, Washington, D. C. Vols. IV and V. Cloth. Price, \$50 per set of 5 volumes. Pp. 791, illustrations; 765, with 27 illustrations. New York & London: Appleton-Century Company, Incorporated, 1941.

These are the concluding volumes in a new system of therapeutics of internal disease. They cover such topics as endocrine glands, the vitamins and allergy, which are, of course, centers of medical interest at this time. Since the contributors are men of repute in the subjects they discuss, the material must be considered adequate to the time of its preparation. There must be recognized that already the advance in some of the fields is considerable if only the last three to six months are considered. Nevertheless the quality and scope of this work make it exceedingly practical as an office and hospital reference, particularly when the physician is confronted with innumerable situations when something must be done and done promptly to meet a medical condition. Thus one finds in the article on hypertension only the most casual reference to recent studies with extracts of kidney.

Healthful Living. By Harold S. Diehl, M.A., M.D., Sc.D., Professor of Preventive Medicine and Public Health, University of Minnesota, Minneapolis. With a foreword by Morris Fishbein, M.D., editor, *Journal of the American Medical Association*. Whittlesey House Health Series. Morris Fishbein, M.D., editor. New revised edition. Cloth. Price, \$2.50. Pp. 499, with 61 illustrations. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1941.

This is a new revised edition of a book that has had a large sale as a textbook in high schools and colleges as well as to the general public. The volume has had several reprintings. The new edition provides new references to up-to-date literature and up-to-date tables of new data, blanks for personal health records and new material dealing particularly with mental health and care of the aged. The book has had almost universal commendation and is undoubtedly one of the best books on personal hygiene available.

Hypophysäre Krankheitsbilder. Von Professor Dr. Wilhelm Faltl. Erweiterte Sonderdruck aus "Wiener Archiv für Innere Medizin," Band 33/34. Paper. Price, 5 marks. Pp. 56, with 5 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1941.

This small monograph consists of ten parts on diseases of the pituitary gland. These are: development, physiology and location of the hypophysis; pituitary cachexia; sclerosis of the endocrine glands; acromegaly and gigantism; Cushing's syndrome, diabetes insipidus and obesity. The booklet contains nothing new. All of the discussion and text material can be found in American literature. This contribution is not recommended.

The Second Yearbook of Research and Statistical Methodology: Book Reviews. Edited by Oscar Krisen Buros. Cloth. Price, \$5. Pp. 358. Highland Park, New Jersey: Gryphon Press, 1941.

This is a compilation of quotations from reviews of books and pamphlets on statistical methods. The excerpts from the reviews are taken from a wide range of journals, including some in the fields of medicine and health and hygiene. Naturally some of the reviews are much more informative than others. However, a pretty good idea of the contents and value of most of the books can be obtained from the selections given.

Man Without Uniform. By Willy Corsari. Cloth. Price, \$2.35. 358. New York: Greenberg, Publisher, 1941.

This is a typical continental scientific novel. It is the life of an investigator in the field of cancer who finds even such a love of research as this cannot shut him out of life and the world of women. Eventually he must state his final choice and he chooses, of course, devotion to doctoring the thousands of sufferers whom he can help. The theme of the book is that of Amsterdam. It seems to lack the qualities that make an absorbing novel.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

BOXING GLOVES

To the Editor:—The selectees of our regiment have been boxing with Everlast EP-14 maroon boxing gloves. The dye has been coming off these gloves and is being rubbed into the bruises, abrasions and lacerations of the fighters. Could any serious dermatitis or infection of the blood or poisoning result from the chemicals in the dye? Could you tell us the formulas of the dyes used and their chemical properties? Would you consider these boxing gloves safe?

Peter Zanca, M.D., 1st Lieutenant, M. C.,
Fort Bragg, N. C.

ANSWER:—This response is made general since use of gloves of a brand other than the one mentioned possibly may lead to the same situation. The red, maroon and brown commonly observed in boxing gloves are not a matter of accident but represent the response to a demand for athletic commissions for colors that will not reveal the unsightliness of blood smears. Tanners for generations have been hard put to produce a soft unglazed red leather to meet this demand. Most such leather bleeds or cracks on contact with water or perspiration or on being rubbed. Boxing glove leather ordinarily represents pickled sheepskins which have been chrome tanned. Many types of pigments and dyes may be used in bringing about a maroon color, together with several adjuvant solutions such as sumac extract, animal oils, plasticizers and retanning agents. In some brown gloves the well known sensitizing dye paraphenylenediamine may be employed. The occurrence of bleeding or cracking in boxing gloves is undesirable but not serious. Some combination of the following red pigments and dyes is likely: crocein scarlet, hyperic salts, red iron oxide, chrome red, cadmium red, para red, helio red and lithol red. Usually more than one dye is applied. Theoretically certain of these coloring materials are harmful, as for example cadmium red, which represents sulfides of cadmium and selenium, and the para reds, which embody a content of paranitranilin, a well known source of dermatitis, but the prospect of practical and widespread harm from dyes in boxing gloves is negligible.

On occasion some one boxer might be made sensitive to or, if already sensitive, an allergic reaction may be precipitated by such material as paraphenylenediamine, chromium salts, sumac extract or paranitranilin, but this risk is subordinate to the potential dangers of bacterial action from oral and nasal organisms promiscuously smeared about the body in any bout.

Elimination of cracking or bleeding from red colors in boxing gloves constitutes a difficult task for the tanner, and possibly, there should be a willingness on the part of athletic commissions to approve of other colors, since the mere hiding of blood stains does not eliminate the insanitary features that may be entailed.

INGESTION OF METALLIC MERCURY

To the Editor:—What happens to one who swallows 27.2 Gm. of pure metallic mercury? The textbooks and the U. S. Pharmacopeia fail to mention the effect of ingestion of metallic mercury. I conclude from blue mass and mercury with chalk that there would be nothing but laxation. I should appreciate complete and authoritative information.

Heinrich Lamm, M.D., La Feria, Texas.

ANSWER:—When a single large dose of metallic mercury, such as 27.2 Gm., is swallowed it might produce transient discomfort as a result of its accelerated descent into the lower part of the esophagus and the stomach. According to the prevailing opinion it would pass through the stomach essentially unchanged. In the small intestine, in the presence of the alkaline contents and bile, a small amount would be converted to mercuric oxide and possibly sulfide. The effect of the mercuric would be threefold: (1) precipitation of protein either in intestinal contents or in the intestinal mucosa; (2) irritation of the intestinal mucosa with increased peristalsis and subse-

location; (3) absorption of the soluble mercuric ion combined with protein. The extent to which such actions take place would depend on the length of time the mercury remained in the intestine. The chances are that under ordinary conditions only a small and perhaps inconsequential amount would be absorbed. Laxation would undoubtedly occur, and the major proportion of the mercury would be excreted as metallic mercury and a small amount in combination with bile.

MAGNESIUM SULFATE AND CONVULSIONS

To the Editor:—A man received a severe blow on the head a number of years ago and lost consciousness. He was hospitalized, and examinations revealed inequality of the pupils, tubular vision, corneal hypesthesia on the side of the larger pupil, absent pharyngeal reflex, diminution in sensation of the left side of the face, loss of bone and air conduction on the left, tremors of the hands, hyperactive deep reflexes on the right, diminution to pain touch and vibration on the left. These diffuse findings, which were determined by recognized neurologists, were supplemented by three or four encephalograms done by leading neurologists, and these revealed definite dilatation of the ventricular system. Other laboratory work (Kahn and other tests) was negative. Shortly after the accident, the patient developed repeated attacks of unconsciousness, during which he sustained repeated fractures of the fingers, nose and zygoma and was repeatedly picked up in the street and hospitalized. Accompanying these attacks was an obvious change in the personality of the patient. He became irritable, impatient and bellicose, and he carried a "chip on his shoulder." Treatment consisting of phenytoin, 1½ grains (0.1 Gm.) every two hours, together with as much as 5 grains (0.32 Gm.) every three or four hours of phenobarbital alum, doesn't seem to affect the frequency of the attacks much. He has been hospitalized, and these massive doses of phenobarbital have been administered by hypodermic because it was believed that the patient was a "phony" and was not taking the medication, but the only effect it had on him was to increase his irritability. Other barbitol derivatives, chloral and bromides were also ineffective. Recently, because of the severity of the injuries sustained by the severe attacks of the traumatic epilepsy, I tried the intravenous injection of magnesium sulfate, 5 cc. of 25 per cent solution. This I give slowly about every other day. I find that this is more sedative than the phenobarbital, without producing any irritative phenomena. The patient professes that he also sleeps better and has fewer attacks. Outside of a slight fall in blood pressure and a diuretic effect, I haven't noticed any ill effects. Please advise me if any work in the past has revealed any danger from repeated intravenous injections of magnesium sulfate, and whether any one has ever tried it for epilepsy and with what results. Of course, I am not seeking a panacea.

M.D., New York.

ANSWER:—It is quite apparent that the blow on the head produced severe cerebral damage. This may have been localized or petechial hemorrhage or subdural hematoma. The underlying pathologic condition may be a posttraumatic softening. The encephalograms would suggest the latter. It is quite probable that sedatives will not control the resulting convulsions. Magnesium sulfate was used originally with the intention of dehydrating the brain. Then there is the additional effect of magnesium. As long as the injections are given slowly enough to avoid sclerosing the veins, there should be no harmful effect from repeated injections. The intravenous injections may be alternated with intramuscular injections. The patient should be given a dry diet, with a fluid restriction to the absolute minimum, 500 or 600 cc. daily. Peterman has recommended the injection of magnesium sulfate in the treatment of convulsions since 1925.

WOUNDS INFLICTED BY STING RAYS

To the Editor:—Wounds inflicted by sting rays are usually extremely painful and disabling. Will you kindly advise me whether any special studies of treatment of such wounds have been made and whether any particular treatment is reported to have given good results?

O. L. Chason, M.D., Mobile, Ala.

ANSWER:—From classical antiquity to the present day this question has been asked but until comparatively recent times not conclusively answered. Aristotle named several dangerous fishes and among them Trygon (the European sting ray). But down to the present it has been declared nonpoisonous. Thus the Cambridge Natural History (Fishes, vol. VII, 1904) states that "... except the mucus secreted by the gland cells of the skin, which may possess venomous properties, no special poison-forming glands in connection with the spines are at present known."

However, in 1905 Antonio Porta (*Anat. Anz.* 26:232) described a glandular structure in the tissues filling the lateral grooves on the under side of the spine of Trygon. His account abounds in errors—e. g. he stated that the spine is renewed every year—and seems to have been comparatively unnoticed.

In 1916 H. Muir Evans, of the Lowestoft Hospital, England, published (*Proc. Zool. Soc. London*, pt. 1, p. 431) a description of "The Poison Organ of the Sting-ray (*Trygon pastinaca*)."

In 1924 he published a general paper, "The Defensive Spines of Fishes . . . the Glandular Structure . . . with Observations on the Nature of Fish Venoms" (*Phil. Tr. Roy. Soc. London* 212:B:1).

By means of sections Evans found on the part of the tail where the spine commences a true glandular epithelium. This epithelium extends forward in each groove on either side of the bony ridge on the under side of the spine. The epithelial cells show signs of secretory activity, and the products are discharged toward the toothed margins of the spine.

Evans made no experiments on the poisonous nature of the spine and the products of the glandular tissue. However, he submitted that the acute pain, inflammation and paralysis are similar to the symptoms produced by the stings of other venomous fishes with which he experimented. He quoted various accounts of an attack by a sting ray resulting in almost instantaneous prostration with convulsions. The sloughing wounds give off a copious fetid discharge and separate, exposing the bone of the arm or the leg.

There are in the literature at least five recent accounts of attack by a sting ray which follow the pattern set out. Caullery (*Compt. rend. Acad. d. sc.* 192:1279, 1931) experimented on dogs by pricking them deeply with dried spines. All died with the symptoms which follow attack by a live ray.

Muir advised from practical experience that wounds made by the spines of any poisonous fish are best treated by injection into the wound of a 2 to 5 per cent solution of potassium permanganate. He had heard that a 1 per cent solution of gold chloride gives good results. Solution of formaldehyde has also been used. In an unpublished report it is stated that after an attack by a sting ray that seemed likely to result fatally, full strength solution of formaldehyde was injected. Probably, however, 5 per cent of commercial product would be strong enough.

FORMALDEHYDE

To the Editor:—This inquiry pertains to the answer given to the query entitled "Masks For Protection Against Formaldehyde Gas" (*The Journal*, June 7, 1941, page 2639). The following sentence is of interest to me: "It is rather rare, however, to obtain a toxic concentration of formaldehyde under ordinary practical conditions, in spite of the fact that the exact range of toxic concentration is not known at the present time." Am I to interpret this statement to mean that persons who might be working in the presence of formaldehyde gas are not apt to suffer ill effects when good ventilation exists and they are not wearing a protective mask? How does the commercial use of paraformaldehyde fit into the various comments made in the answer referred to? Finally, what are the risks of cutaneous irritation due to handling of articles moistened with 10 per cent formaldehyde?

M.D., Illinois.

ANSWER.—It is indeed curious that in spite of the widespread industrial use of formaldehyde and its products there is so little known, relatively, regarding its physiologic properties. It is true that bronchitis and other forms of mucous membrane irritations have long been suspected, but never actually proved, as due to exposure to formaldehyde. As far as can be determined, if good ventilation exists and if the concentration of formaldehyde does not exceed 0.025 mg. per liter or 20 parts per million (Ficklen) during the entire work period, the worker will not suffer any harmful effects even though he does not wear protective masks. Information is available that with good ventilation this concentration is hard to maintain for any length of time, under ordinary work conditions. However, special protective masks are advised when one is exposed to formaldehyde in cleaning out huge tanks where the ventilation is poor. It must not be forgotten that differences in susceptibility of the mucous membranes to formaldehyde exist also. Although there are no data readily available, it would seem as if the same facts would apply also to the commercial use of the polymerization product of formaldehyde, paraformaldehyde. Toxicologic works do not mention any significant toxic differences between formaldehyde and paraformaldehyde. As regards cutaneous injury, formaldehyde is a strong sensitizing agent. Five per cent is usually the upper limit of the concentration of formaldehyde employed to make patch tests of hypersensitive skins. So there is a definite risk of cutaneous irritations from articles moistened with 10 per cent formaldehyde. These irritations may vary from extensive vesicular dermatitides in more sensitive to dryness, thickness and fissuring of the skin in less sensitive individuals.

RATIO OF MASCULINE BIRTHS IN WARTIME

To the Editor:—Is the proportion of male births greater for a few years after a war of the magnitude of World War No. 1?

F. A. Neergaard, M.D., Harriman, Tenn.

ANSWER.—The proportion of male births to female was above its prewar level in every European belligerent power during the last years of World War I and for perhaps two or three years afterward. The proportion of male births increased also in many of the important European neutral countries, including Norway, Sweden, the Netherlands and (for the year 1920) Switzerland. There was an observable rise in Australia, but not in the United States or in New Zealand, among the non-European belligerents. The increase in the proportion of male births, where observed was of short duration. Such explanations

usually based on differential sex mortality before birth. It has been suggested, for example, that mobilization of an army, by removing a large proportion of the male population, increase the average interval between pregnancies and thereby improve the ability of the maternal organism to support the male fetus which normally suffers greater mortality hazards than the female. This has scant biologic foundation and would not explain the rise in neutral countries, however, or the absence of an increase in the number of masculine births in the United States during and after the last war. The hypothesis that malnutrition favors the male embryo is not supported by data on the sex ratio at birth during famines in India. A simple explanation that seems entirely adequate has not yet been offered.

TRACTION FOR FRACTURED FEMUR

To the Editor:—In treating fractured femurs with traction apparatus, does some angulation of the fragments at the fracture site occur when the patient moves, as in trying to get on a bed pan, even though many types of apparatus are made to adjust themselves so as to have the traction always in a straight line? This is one of the arguments that was given at the Cleveland convention by men demonstrating the use of the hanging cast in fractures of the humerus. Men here cannot see any other method but absolute immobilization of such fractures of the humerus. I would appreciate any information you may have to show that such angulation does occur.

Theodore P. Murphy, M.D., Montpelier, Vt.

ANSWER.—The many forms of traction apparatus used for fracture of the femur all have merit, but they are not "fool proof." Not only must care be taken to be certain traction is really working, but also some form of lateral splinting is often advisable to push the fragments over into proper alignment. The Thomas traction splint has been used for many years with generally satisfactory results. Other methods of traction, such as skeletal traction and the Russell countertraction method, also have produced satisfactory results. The use of the bed pan tends to disturb the relations of the fragments, but using the Bradford frame with an opening beneath the buttocks permits use of the pan without disturbing the position of the leg.

Angulation following a fracture of the femur certainly does not always occur and can be avoided or minimized through the proper use of traction and side splints. If angulation cannot be controlled properly, it may be better to open the fracture and apply a vitallium plate. If this form of internal fixation is used, external support by a cast is also necessary. Overlapping does not necessarily mean a poor functional result if the fragments are in correct alignment and there is no angulation.

Comparison cannot be readily made between the various methods of treatment of fractures of the humerus and those of the femur, as the latter is a weight bearing bone while the humerus is not.

While many objections to hanging casts for fractures of the humerus have been advanced, good results have been and are being obtained through this simple procedure. Apparently it is most effective in fractures of the upper half of the humerus.

PURPURA HEMORRHAGICA FROM ARSENICALS

To the Editor:—A white woman aged 18 received in the course of ten months twenty-six intravenous injections of neorsphenamine and eighteen injections of a bismuth compound given at weekly intervals in doses of 0.6 Gm. and 2 cc. respectively for preceptive syphilis. Prior to the last dose of neorsphenamine she noted large bruises on two areas of her body. She was given 0.6 Gm. of neorsphenamine intravenously. The following morning she awakened bleeding from the mouth, gums, pharynx and profusely from the uterus (the menses were due). Her hemoglobin was 13.6 Gm. per hundred cubic centimeters and the bleeding time seven hours. Bleeding from the mouth gradually subsided and the menses returned to a normal flow. Four days later her hemoglobin was down to 9 Gm. per hundred cubic centimeters and the bleeding time was twenty minutes. I assumed that this purpura was from the neorsphenamine. Does this contraindicate additional arsenical treatment? If so, should the required number of intravenous treatments be replaced by a bismuth compound?

M.D., Minnesota.

ANSWER.—This patient doubtless has a disturbance of the hemopoietic system as a result of the arsenical therapy. The "large bruises" can be considered as early evidence of it. Her blood should be checked from the standpoint of granulocytopenia and the platelet count may be found as low as 310. This is a serious reaction to the arsenicals and at this time it is unwise ever to give these patients further arsenical treatment. For the present it would be just as well to suspend the syphilitic therapy, for, after all, one is treating the patient for syphilis. A transfusion must be considered if the condition demands it. If there is any question, it is advisable to have consultation.

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THE VALUE OF PHYSICAL THERAPY IN INTERNAL MEDICINE

GEORGE MORRIS PIERSOL, M D

PHILADELPHIA

It may be stated with little fear of contradiction that there is no field of therapeutics less understood and less frequently employed by internists than physical therapy. There are several reasons that account for this unfortunate state of affairs which has its inception in our medical schools. A survey of the curriculums of undergraduate as well as graduate medical courses reveals the fact that, if taught at all, but little time is devoted to the various aspects of physical therapy and that at best the courses available to students of medicine are inadequate and superficial. The average physician, therefore, approaches the practice of medicine knowing little about one of the oldest and most useful branches of therapeutics. Physicians, as a rule, because of their lack of understanding, evince little interest in acquiring a sound working knowledge of physical therapy. Furthermore, the proper application of physical therapeutic methods requires not only time but a certain amount of manual dexterity. Since physicians have been loath to give of the former or to acquire the latter, the field of physical therapy has been neglected by the medical profession.

Gradually the various procedures that are embraced in this form of therapeutics have been delegated to technicians who not only have acquired skill in carrying out such measures but have been allowed to usurp the actual prescribing and direction of this type of therapy. The lack of appreciation on the part of the medical profession of the value of physical therapy and its disinclination to devote the time and study necessary to master the basic principles which underlie it have been major factors in affording opportunity for cultists to develop and monopolize this field. The public has long been aware of the value of physical therapeutic methods. It is unfortunate that the profession should have turned a deaf ear to this popular demand, thereby allowing less orthodox and less scientifically trained groups to become aggressively active in a field which should be and should always have been under the control and domination of qualified physicians.

The first step toward correcting this situation is to revise our educational methods as far as physical therapy is concerned. Students of medicine, undergraduates and graduates, as well as interns and residents, should be taught that in the field of therapeutics in its broadest sense, physical methods occupy a recognized position of importance. To many the term "physical therapy"

conjugates up a picture of elaborate apparatus and expensive paraphernalia. Such a conception is both erroneous and discouraging. It should be emphasized that, basically, physical therapy is founded on procedures that are relatively easy, that are readily available and that require for their proper application not elaborate equipment but a thorough understanding of their underlying physiology and their proper uses and limitations.

In this discussion, no attempt will be made to deal with such highly technical subjects as electrotherapeutics and radiation therapy. Such procedures should not be so generally available, since their safe and proper application requires adequate special training. An effort will be made to emphasize those physical therapeutic procedures concerning which all physicians should have sufficient working knowledge to supervise and direct their use intelligently, even though they lack the personal skill to carry them out. This category embraces massage, exercise, the application of heat and hydrotherapy.

MASSAGE

Among the oldest, best known and most frequently employed forms of mechanotherapy is massage. In view of this, it is the more remarkable that physicians as a whole possess so little understanding of the effects of massage and the methods of application. Pemberton¹ emphasizes this in his statement "There is probably no other measure of equal known value in the entire armamentarium of medicine which is so inadequately understood and utilized by the profession as a whole." Since few physicians are capable of directing the proper application of the various technics of massage, in this country at least, the task is delegated to lay technicians who, for lack of expert guidance, more often than not decide on the form of massage to be used as well as the duration and frequency of its application. Responsibility for all forms of therapy is definitely the physicians'. It is as unjustifiable for them to shift that responsibility to a physical therapy technician, no matter how well trained, in the case of massage, as it would be for physicians to delegate the details of drug therapy to a druggist.

In spite of the work of Pemberton,² Coulter,³ Mennell⁴ and others who have studied with modern methods the physiologic effect of massage, much remains to be done to bring about a complete understanding of the basic principles of this subject. Pemberton and his associates have shown that even after vigorous massage there is no production of lactic acid in the muscles, and consequently the acidosis characteristic of exercise is not

1. Pemberton, Ralph. *Physiology of Massage*, in *Handbook of Physical Therapy*, ed 3. Chicago: American Medical Association Press, 1939, pp 73-87.

2. Mook, H. E. Pemberton, Ralph and Coulter, J. S. *Principles and Practice of Physical Therapy*, Hagerstown, Md., W. F. Prior Company, Inc., 1934, vol 1, chap 6.

3. Coulter, J. S. in *Encyclopedia of Medicine, Surgery and the Specialties*, edited by G. M. Piersol and others. Philadelphia: F. A. Davis Company, 1933, vol 8, pp 5-98.

4. Mennell, J. B. *Physical Treatment by Movement, Manipulation and Massage*, Philadelphia: P. Blakiston's Sons & Co., 1933, p 61.

ent. They were unable to demonstrate that massage brought about the loss of lactic acid and alkalosis that accompanies the application of external heat. They believe that the important effect of massage on the circulation is different from that induced by exercise or the local application of heat and is to be explained on the basis of the effect which even mild stroking has on the capillary bed, as demonstrated by Krogh.⁵ The dilatation that follows light pressure is transitory, but heavier pressure causes more extensive and persistent widening of the capillaries. Direct observation on the capillary circulation indicates that massage causes an increased rate of blood flow and changes in the vessel walls, followed by an increased interchange of substances between the blood and tissue cells and consequent improvement in metabolism.

The mechanical effect of massage on the return flow of the venous blood and lymph to the heart has long been recognized. This effect is especially obvious in the presence of edema that can be favorably influenced by even light centripetal stroking. The therapeutic application of this fact has been utilized in the treatment of local edema of traumatic origin but has not been taken advantage of in the management of edema due to general causes. Since by pressure fluids can be displaced from the subcutaneous tissues, it would seem that massage might play a useful role as an adjunct in the relief of edematous states.

It was shown by John K. Mitchell⁶ that massage increases the number of red blood cells and the amount of hemoglobin in the circulating blood. This effect was observed not only in health but in anemic states. These conclusions were confirmed by subsequent observers.

The effect of massage on the nervous system varies according to the type of massage employed, its intensity and duration. Properly applied massage may cause either a sedative or a stimulating effect.

It is generally believed that heavy massage is capable of reducing local deposits of fat. Clinical and experimental evidence show this to be a popular misconception. There are no scientific data to support the contention that massage ever removed collections of adipose tissue from various parts of the body. A similar misunderstanding exists in the minds of those who believe that massage will strengthen muscles. There is general agreement that massage does not increase muscular strength, which can be brought about only by active exercise.

Contrary to what might be expected, it has been shown that massage has little effect on general metabolism. Many observers have noted a definite increase in the output of urine. No disturbance of the acid-base equilibrium of the blood has been recorded, nor is the consumption of oxygen influenced by massage. After a careful review of the subject, Pemberton comes to the conclusion that "the cumulative effect which massage exercises on various metabolic processes probably lies in the mechanical influence on the circulation of the parts concerned."

The diseases in which massage is indicated are for the most part of a chronic nature, since the therapeutic effect of massage is brought about slowly as the result of repeated use over a long period of time. Therefore massage has a limited field of usefulness in acute conditions that run a short course. It has its greatest value in chronic states that involve long periods of inactivity which bring about atrophy of muscular tissue. Under

such circumstances massage helps to prevent further atrophy, aids in the absorption of exudates and toxic waste products and restores normal physiologic processes in the masses of muscle. When to these effects are added the influence of proper massage on the nervous system, it is easy to understand why massage has become an indispensable aid in arthritis and allied rheumatic conditions as well as in fibrositis and other muscular derangements. It is almost equally useful in long-continued convalescence, in functional nervous disorders and in asthenic states often included in the term "neurasthenia." The possible value of massage in certain secondary anemias has already been referred to. The helpful effect of suitable upward stroking on the venous return flow and in increasing the absorption of edematous fluid into the circulation suggests that in certain stages of chronic cardiac failure massage could be used to advantage to help restore circulatory equilibrium and relieve edema, a fact which has been generally overlooked. There are few medical conditions for which, at some time, massage has not been advocated, often with little or no sound basis. Like all forms of therapy, it has its definite indications as well as its contraindications with which internists should be thoroughly familiar.

EXERCISE

It is generally admitted that the proper kind and amount of physical exercise is essential for the maintenance of good health. In this country during the past fifty years the trend in exercise has been toward less formal gymnastics, more sport activities and a decided increase in the employment of corrective exercise.

Physicians should acquaint themselves with the indications for and the possibilities of the various types of exercise; they should know how and when to prescribe them and be willing to supervise their application. This is especially true of corrective exercise, a valuable form of physical therapy that is too much neglected. The physician is prone to think of exercise as a means of increasing muscular strength rather than as an aid in restoring normal function.

The mechanism of muscular contraction is still not entirely clear. Muscular work causes the expenditure of energy. How this energy has been produced has been a subject of much investigation. The fundamental work of Fletcher and Hopkins⁷ has shown that, when a muscle contracts, glycogen, which is present in muscles in large amounts, disappears, lactic acid accumulates and carbon dioxide is driven off. The reaction of the muscle then becomes less alkaline because of increasing amounts of carbonic acid and lactic acid. This series of chemical changes which bring about the liberation of energy which enables muscles to contract requires no oxygen. The whole process is referred to as the contractile phase of muscular contraction. The accumulation of lactic acid causes a cessation of muscular movement, and for further muscular effort additional changes must take place which are dependent on oxidation and are known as the recovery phase of muscular contraction. In this phase, in the presence of adequate oxygen, the lactic acid disappears, glycogen reaccumulates and the muscles return to a state of alkalinity. If muscular effort is to be continued, large amounts of oxygen must be available. It has been shown that an individual doing hard muscular work will require ten times more oxygen than is needed when he is at rest. This increased oxygen requirement is met by com-

5. Krogh, August: *Anatomy and Physiology of the Capillaries*, ed. 2, New Haven, Conn., Yale University Press, 1929.
6. Mitchell, J. K.: *Am. J. M. Sc.* 107:502, 1894.

7. Fletcher, W. M., and Hopkins, F. G.: *J. Physiol.* 35:247-309, 1906-1907.

persatory changes in the circulation and in respiration brought about by a greater volume of breathing and increased circulation of the blood. Therefore, during exercise there is an increased pulse rate, a larger output of blood, an elevated blood pressure and a more rapid respiratory rate. These vary with the rapidity, severity and duration of the muscular effort according to the degree of training of the person.

The surgeons, orthopedists and neurologists have taken advantage of the therapeutic value of exercise to a greater extent than have internists. Nevertheless, there are certain conditions that constantly come under the observation of physicians which can be greatly benefited by the employment of appropriate exercises. It has been frequently observed that the commonest defect noted among the people of this country is faulty posture with its resultant incorrect body mechanics. The far reaching, harmful effects of poor posture as well as its influence on various disease conditions and on the morale and psychology of patients is too well known to require elaboration. A better understanding on the part of physicians in general of the results of postural strain and faulty body mechanics, coupled with an intelligent knowledge of the therapeutic exercises necessary to overcome such conditions, would better enable them to restore the physical and mental well-being of many a patient, a task which today must too often be turned over to technicians or to those who have become the advocates of certain special schools of mechanotherapy.

Internists might well be more alive to the value of certain forms of exercise in the treatment of cardiac disease. Years ago, the Irish clinician Stokes advocated exercise, particularly mountain climbing, for certain types of heart disease. Later such exercises were put on a more systematic and scientific basis by Oertel. Today the Stokes-Oertel graduated hill-climbing exercises for selected cardiac patients are recognized as an effective form of therapy which, however, is largely overlooked by clinicians and rarely employed except in well regulated health resorts. Another form of exercise of undoubted value in many cardiac conditions was introduced by August and Theodore Schott of Nauheim. They developed resistance exercises, regulated movements that could be carried out by trained attendants with little exertion and no fatigue on the part of the patient. That all such exercises should be carefully controlled and immediately stopped on the appearance of any symptoms of cardiac fatigue such as dyspnea, palpitation, precordial distress or undue exhaustion is axiomatic. In the presence of decompensation, rest is obviously essential, but many cardiac patients are forced into states of invalidism because rest and the avoidance of all forms of exertion are insisted on unnecessarily.

There are few persons who cannot derive benefit from properly regulated and suitable voluntary free exercise. Careful judgment should be shown in prescribing exercises for middle aged and older persons, particularly those who are suffering from early and often symptomless cardiovascular disturbances. Serious harm, at times even death, has resulted from a physician casually telling such patients that they need exercise without specifically prescribing the character and the amount. The tragedies of the handball and tennis courts and the golf course bear eloquent testimony to this fact. Lack of time or interest are the chief reasons that prevent the busy practitioner from specifically prescribing suitable exercises. This difficulty may be overcome by having on hand printed instructions for a set

of simple exercises that may be given patients, with modifications and restrictions suited to their needs, or, as Coulter has suggested, by making available to such patients one of the useful handbooks on exercise that have been published under the direction of the Council on Physical Therapy of the American Medical Association.

EXTERNAL HEAT

One of the most valuable physical therapeutic measures available is the application of external heat, which may be general or local. Although the systemic use of external heat has been employed for many years, it is only recently that the value of the artificial production of an increase in bodily temperature or "fever therapy" has been fully appreciated. The fever produced is the result of creating by physical means a disproportion between heat production and heat dissipation. The production of artificial fever may be brought about by various methods; from such comparatively simple procedures as hot tub baths and hot packs to the most complicated forms of heat cabinets. Artificial fever therapy is a major procedure which should be carried out only by those thoroughly familiar with its various aspects and in suitable institutions. It would be inappropriate to consider here the technic of fever therapy. The procedure is obviously a heroic one, and patients who are subjected to it should be selected with the greatest care and, as Krusen⁸ has pointed out, should be conditioned both physically and psychologically for the ordeal of enduring prolonged high fever therapy. Although the possibilities of this form of therapy are great, it obviously has limited application. After a careful analysis of the literature, Krusen found that fever therapy had been employed for more than fifty diseases, in the majority of which it has proved of little value. It has been found of distinct advantage in syphilis, particularly in syphilis of the central nervous system. Gonorrhea and its complications, atrophic arthritis, undulant fever, rheumatic fever, intractable bronchial asthma and some forms of neuritis have shown a favorable response to this form of therapy. Most recently encouraging reports have come from the Mount Sinai group in New York of the results of fever therapy in subacute bacterial endocarditis when the treatment is fortified by chemotherapy and repeated blood transfusions.

The general application of heat is by no means limited to the production of prolonged artificial fever. It is much more often employed to bring about various degrees of sweating. To accomplish this, the various forms of cabinets used for fever therapy may be employed. The best known methods are the use of hot packs of various kinds, steam baths, hot room and cabinet baths. The heat, whether it is dry or moist, thus applied is maintained for only a short time, not more than thirty minutes even when free sweating is to be induced. Whatever rise in body temperature occurs is but slight and transient.

Popular faith in the ability of sweat baths to eliminate poisonous waste products and to reduce weight has given this form of therapy great vogue among the laity, which is too prone to indulge in it without medical supervision or approval. Devices for inducing sweats form an important part of all physical therapeutic establishments and are the basis for the Turkish bath.

It is unnecessary to dwell on the danger of this form of therapy when it is practiced to excess or unsupervised or by those whose physical condition contraindicates

8. Krusen, F. H.: *Physical Medicine*, Philadelphia, W. B. Saunders Company, 1941, p. 45.

cates its use. Patients become conscious of palpitation and a feeling of fullness and a throbbing in the peripheral vessels. Syncope may occur, especially in those who are sitting erect in cabinets; for that reason it is best to give such treatments with the subject recumbent. If sweating is profuse and prolonged, dehydration and hyperventilation bring about alkalosis. In many instances there is a decrease in the serum chlorides. The blood urea, uric acid and creatinine are little if at all affected; the same is true of the non-nitrogenous constituents of the blood. The loss of weight following prolonged sweating is rarely excessive, is of short duration and is due to dehydration. To offset the dehydration with its attendant loss of electrolytes, adequate amounts of water and in some instances sodium chloride should be administered during the sweat.

Diaphoresis brought on by the general application of heat is at times of value in selected cases of arthritis, fibrositis and allied conditions as an adjunct to other forms of therapy. As a method of promoting loss of weight, unless combined with exercise and dietetic restrictions, it is of little value. Formerly it was extensively employed in acute and chronic glomerular nephritis in which there was nitrogen retention and threatened renal toxemia. Since, as indicated, the application of external heat brings about loss of water and of sodium chloride without influencing to any noteworthy extent the nonprotein nitrogen of the blood, there is some question as to its value in impending uremia, and the use of sweats in renal diseases has lost much of its earlier favor.

LOCAL APPLICATION OF HEAT

The local application of heat constitutes one of the commonest procedures in medicine, readily available and frequently applicable. There are three well recognized methods by which heat is locally applied to the body: 1. Conduction, when it is applied by direct contact from a heated object such as a hot brick, a hot water bag or an electric pad. 2. Convection, when the heat is applied to the surface of the body from some external source such as heated lamps, coils or reflectors. 3. Conversion, in which heat is developed in the tissues of the body by reason of the resistance which they offer to the passage of a high frequency current (diathermy).

The physiologic effects of local applications of heat differ but little whether conductive, convective or conversive heat is used, with the exception that the former is least penetrating and the latter produces the greatest amount of penetration. When heat is locally applied, the blood vessels dilate, the rate of blood flow increases, as does the transfer of fluid from the blood to the tissue. This acceleration in blood flow interferes with local rise in temperature by distributing the heat throughout the body. Local heat tends to produce an alkalosis and to increase local metabolic activity and possibly phagocytosis.

The methods employed for applying heat locally are numerous and include devices that depend on heated air, chemical heat, electrically heated applicators, heated solids and semisolids such as mud and paraffin and water heated applicators.

The indications for the use of local heating are many and are essentially similar whether the heat used is of one kind or of another. Among the conditions for which local heat is recommended, again arthritis and rheumatic states come first. It has been used in many inflammatory conditions, especially pelvic, as well as in traumatic conditions and in peripheral vascular disease.

LIGHT

Closely allied to the therapeutic use of heat is that of light. In recent years there has been an ever increasing interest in the use of ultraviolet, visible and infra-red rays in the treatment of innumerable diseases. The subject has become so involved and highly technical and so much controversy exists over many of its important aspects that it seems futile to attempt to epitomize it in this limited presentation. The physiologic actions and indications for use of the visible and infra-red rays differ but little from those already discussed under the general and local application of heat. This is not true of ultraviolet radiation which, although it has been recommended for a large number of diseases in which it does no particular good, is nevertheless almost specific in rickets and tetany and of acknowledged merit in many cutaneous diseases and in calcium and phosphorus deficiency states. The empiricism that has been so conspicuous in light therapy must give place to more accurate scientific knowledge of the dosage of light radiation, the relative value of the innumerable types of therapeutic lamps and their proper application. It is gratifying to note that through its researches, the Council on Physical Therapy is doing outstanding work in the standardization of light therapy. The value of light radiation is undeniable, but it is not without its dangers, which should be more fully appreciated. Its indiscriminate use by those who know little of its physiologic effects should be controlled.

HYDROTHERAPY

Water in any of its forms is one of the most generally useful and easily available therapeutic agents. For centuries it has proved a valuable adjunct in the treatment of disease, yet among the medical profession hydrotherapy no longer enjoys the popularity it was once accorded.

It is a most flexible therapeutic agent which, as Krusen aptly puts it, "can be variously modified from the solid form (ice) to the liquid form, to the gaseous form (steam)." According to Baruch, who did so much to popularize this form of therapy in America, hydrotherapy in the broad sense includes the application of water in any and all of its various forms.

The stimulating, tonic and sedative effect of baths of varying temperatures and different mechanical forms is generally understood and needs no detailed discussion. There are, however, several aspects of hydrotherapy of particular interest to physicians.

The neuropsychiatrists have long appreciated the value of prolonged tepid or warm baths in the control of various maniacal states. A lesson could be learned from their experience, and hydrotherapy might be resorted to more often in the management of many forms of excitement and insomnia instead of overwhelming such patients with sedative drugs.

The chief physiologic effect of applying water to the body is to cause changes in temperature. This fact furnished a basis for the use of cold baths in the control of fever. The best example of this is the Brand bath or some of its modifications which did much to revolutionize the treatment of typhoid in the days when that infection was epidemic. The Brand bath is no more specific for typhoid than for any other infection characterized by long-continued fever and toxemia. Its effect is not primarily to reduce a rise in temperature so much as to improve the vasomotor tone, lessen the pulse rate, increase the blood pressure and control the nervous manifestations of the "typhoid state."

Medical baths have long enjoyed a curative reputation in many conditions. Whether the good results often recorded are due as much to the minerals in solution as to the effects of the water itself is a much debated subject. Among medicated baths the effervescing ones that contain nascent carbon dioxide, such as are found at Nauheim and elsewhere in Europe, are the best known and most useful. To obtain the benefits of such baths, it is no longer necessary to go to the spas where they occur in nature, since effective carbon dioxide baths can be readily prepared artificially. In certain types of cardiac disease, especially those in which there still remains a reasonable amount of cardiac reserve, the Nauheim bath if properly given and accompanied by suitable rest and exercise has proved of undoubted value. Here again is a form of hydrotherapy largely lost sight of which is capable of being of considerable clinical help to physicians.

It must be pointed out that the effectiveness of all forms of physical therapy may be greatly increased by the proper and intelligent combination of several procedures. Nowhere is this better exemplified than in the S. Weir Mitchell "rest treatment," in which the desired results were obtained by the combined use of rest, massage, exercise and hydrotherapy in conjunction with hypernutrition.

An essential and important adjunct to all forms of physical therapy is rest. The value of massage, exercise, heat and bathing is greatly enhanced when combined with adequate rest and relaxation and conversely is decidedly lessened when rest is neglected and states of fatigue are allowed to occur. This should not be lost sight of when physical therapeutic measures are employed. The physician should insist that they be carried out in a quiet, orderly fashion and that ample time be set aside for the rest by which they should be followed.

COMMENT

An effort has been made to stress certain methods of physical therapy that are based on sound physiologic principles, that are of acknowledged value and proved usefulness, that are readily available to all physicians and for the most part can be carried out with little difficulty even in the home. By so doing it is hoped that the interest of physicians in general, but those concerned in internal medicine in particular, may be revived in the far reaching possibilities of this broad therapeutic field. If physical therapy is to remain under the control of physicians and advance as it should along sound scientific lines, the indifference which the internists as a group have displayed in the past must give way to an active interest in developing a constructive, forward looking policy to improve the practice of and extend education in physical therapy.

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ABSTRACT OF DISCUSSION

DR. JOHN S. COULTER, Chicago: It is gratifying to hear an internist comment favorably on the use of physical therapy. The Council on Physical Therapy of our association is trying to interest physicians to use simple physical agents in their practice. It is doing this by publishing articles in *THE JOURNAL* and through the *Handbook on Physical Therapy*, the fourth edition of which is now being prepared. This council is cooperating with the Council on Medical Education and Hospitals to increase the number of medical schools giving courses in physical therapy. One reason internists do not use physical agents in the treatment of patients as often as they should is that they feel sometimes that the expense is too great. In treating chronic diseases in which physical therapy is indicated, if physicians will arrange a home program of treatment the

patients will receive benefits from physical therapy that they would not otherwise. In the use of heat and massage to increase peripheral circulation or exercise to correct posture and increase muscle strength it is not enough to send a patient to a physical therapist once a day and expect to receive the maximum benefits. In treating such a disease as chronic arthritis with physical therapy it is advisable to instruct the patient or some member of the family to use physical therapy at home two or three times a day, in addition to the patient's visiting the physical therapy department. We recommend the use of simple agents, and the Council on Physical Therapy will be glad to send physicians designs for making many things, such as the home made electric lamp baker and exercise apparatus, so that physical therapy can be used without great expense and a home program of treatment established. I too want to emphasize that instructions for the use of physical agents must be carefully given. The instructions for home treatment should be as definite as for drug therapy. Mimeographed instruction sheets should be used for this purpose, and the Council will send, on request, samples of the instruction sheets that are used. In the present emergency the National Research Council has appointed a subcommittee on physical therapy to cooperate with and to advise the Surgeon Generals of the Army and the Navy, the Veterans Administration and the Public Health Service in the use of physical therapy in government hospitals. We hope there will be the same use of good physical therapy in this emergency as there was in the last.

DR. RALPH PEMBERTON, Philadelphia: I want to express satisfaction as an internist with this paper by Dr. Piersol, which seems to me to be timely. I have observed the physical therapeutic scene for many years, and from the standpoint of one interested in the influence of physical therapy on normal physiologic processes as well as on pathologic processes I have been amazed at the extraordinary neglect which we internists have accorded to this field. Dr. S. Weir Mitchell, who was fifty years ago one of the best clinicians and one of the best physiologists in the country, laid down principles in the use of physical therapy which have been followed to this day by the neurologists, by orthopedists and by others. But for some peculiar reason we internists have not taken cognizance of the effects which physical therapy will bring about, and by that I mean chiefly heat, massage, rest and exercise. It is also worthy of note that Jack Mitchell showed, forty years ago, that it is possible to increase the peripheral red cell count in some of the anemias by means of massage. Doubtless there are limitations to the extent to which anemia patients and perhaps cardiac patients should be subjected to such measures, but it is fair to say that there is enough of a nucleus of truth to justify the view that internists should utilize the influence of these factors more widely than they are now doing. Perhaps the most significant lesson to be deduced from Dr. Piersol's paper is the fact that he is speaking as vice dean for medicine of the Graduate School of the University of Pennsylvania, and I hope that his remarks will be regarded as a plea for more widespread instruction, undergraduate as well as graduate, in the principles of physical therapy.

DR. GEORGE MORRIS PIERSOL, Philadelphia: Dr. Pemberton has referred to the question of teaching physical therapy. Personal experience would indicate that the most difficult course to organize for graduate students in medicine is the one in physical therapy. You may comb a great metropolitan center and still find little available material to give students a constructive course along this line. The importance of the whole question of exercise and posture—Dr. Coulter has already stressed that—is evident to any one who has an opportunity to examine draftees for the Army. As a nation, faulty posture is one of our outstanding shortcomings. Among those nations in which mass exercise has been in vogue for many years the youth, instead of adopting the poor posture with which we are familiar, have acquired good posture and consequently are better prepared for military and similar services. Again it must be emphasized that all procedures in physical therapy, including those used in heart disease, must be looked on as adjuncts; not intended to replace well recognized forms of therapy, but as useful aids to them which, if employed more often, would tend to shorten convalescence and increase the well being of patients not only physically but also psychologically.

PNEUMONIA IN CHILDREN

A REVIEW OF SEVEN HUNDRED AND THIRTY-ONE CASES

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A review of pneumonia in 731 children entering Cook County Hospital from April 1939 through May 1940 has enabled us to collect valuable data and make numerous observations on a disease which has recently held the limelight because of new trends in therapy. In view of the type of patients who frequent such a hospital (all are indigent and many are malnourished children in the late stages of the disease) this has been a severe test for the efficacy of drug therapy.

The original plan of the pneumonia service¹ was to have a control series of patients receiving nonspecific therapy and a comparable group receiving specific serum or chemotherapy, but by the time sulfapyridine became available in sufficient quantities (April 1939) there had been satisfactory reports, experimental² and clinical,³ to warrant the use of the drug. It was deemed unwise to withhold specific therapy from acutely ill patients for the sake of statistics. The plan was therefore changed so that patients were treated according to the severity of the disease without any attempt to establish a control group. During the fourteen months of observation, 731 children from 1 to 13 years of age were studied and treated; only those with definite physical, laboratory and roentgen evidence of pneumonia were considered in this group.

PROCEDURE

Every child entering the Cook County Hospital for whom a diagnosis of pneumonia was made or suspected was referred to a special resident in charge of the pneumonia service. The resident confirmed the diagnosis and immediately (or, if the patient entered during the night, early the next morning) collected sputum for typing. Early in the series, sputum was collected by direct laryngoscopy; later satisfactory specimens were obtained from the lower part of the pharynx by gagging the patient with a tongue depressor. The mucopurulent material was collected on sterile swabs, placed in sterile test tubes and immediately taken to the nearby diagnostic laboratory of the Department of Health of the State of Illinois for typing and culture.⁴

From the pneumonia service of Dr. Butler and Dr. Hoffman from the Cook County Children's Hospital and the Departments of Pediatrics of Rush Medical College, the University of Illinois College of Medicine and the Cook County Graduate School of Medicine.

¹ Dr. Maurice L. Blatt, chief of staff, Cook County Children's Hospital, instituted a special pneumonia service to be supervised by Drs. Butler and Hoffman.

² Whitby, L. E. H. Chemotherapy of Pneumococcal and Other Infections with 2 (p-Aminobenzenesulfonamido) Pyridine, *Lancet* 1: 1210-1212 (May 28) 1938.

³ Evans, G. M., and Gaisford, W. F. Treatment of Pneumonia with 2 (p-Aminobenzenesulfonamido) Pyridine, *Lancet* 2: 1419 (July) 1938. Barnett, H. L., Hartmann, A. F., Perlev, Anne M., and Ruhoff, Mary B. Treatment of Pneumococcal Infections in Infants and Children with Sulfapyridine, *J. A. M. A.* 112: 518-527 (Feb. 11) 1939. MacColl, W. A. Clinical Experience with Sulfapyridine, *J. Pediatr.* 14: 277-289 (March) 1939.

⁴ Dr. H. S. Shaughnessy, chief of laboratories of the Department of Health of the State of Illinois, and his staff aided in the bacteriologic studies.

Blood cultures, complete blood counts, urinalyses and roentgenograms of the chest were ordered immediately.

For all severely ill children who were suspected of having or who definitely had pneumonia, treatment with sulfapyridine was instituted as soon as the clinical diagnosis was made, usually before the bacteriologic diagnosis was made. Those who later were shown not to have pneumonia were dropped from the series. Of the 731 children admitted with a diagnosis of pneumonia, 656 (87.1 per cent) received sulfapyridine, 19 (2.6 per cent) received serum in addition to the drug and 75 (10.2 per cent) received no specific medication because they were moribund or convalescent on admission.

The usual dose of sulfapyridine was 1½ grains (0.1 Gm.) per pound of body weight on the first day and

TABLE 1.—Age, Sex and Race Distribution in Seven Hundred and Thirty-One Cases of Pneumonia—Cook County Children's Hospital, April 31, 1939 to May 31, 1940

Age, Years	Lobar Pneumonia— 39 Cases			Bronchopneumonia— 332 Cases		
	1-2	2-4	Over 4	1-2	2-4	Over 4
White boys	20	29	95	37	27	32
Negro boys	15	22	55	29	18	12
White girls	19	18	63	46	23	31
Negro girls	12	21	30	30	28	19
Total	66	90	243	142	96	94

TABLE 2.—Bacteriologic Types of Organisms

Organism	Number of Cases	Percentage
Pneumococci	572	...
Single strain	461	63.0
Mixed strain	105	14.7
Unclassified	3	0.4
Streptococci, staphylococci and others	126	17.2
No specific organism	23	3.1
Not examined	10	1.3
Total	731	99.7

TABLE 3.—Relation of Pathologic Process to Bacteriologic Type of Organism

Organism	Type of Pneumonia			
	Lobar		Bronchial	
	No. of Cases	Percentage	No. of Cases	Percentage
Single strain pneumococci	285	59.5	195	40.5
Mixed strain pneumococci	53	50.0	52	50.0
Streptococci, Staphylococci and others	64	47.0	72	53.0
Unclassified	7	87.5	1	12.5
Not examined (2)	.	....	.	..

¾ to 1 grain (0.04 to 0.06 Gm.) per pound on subsequent days. Children over 6 years of age received somewhat smaller doses, but at least 1 grain (0.06 Gm.) per pound the first day and ½ grain (0.03 Gm.) per pound on subsequent days. The first two doses were larger (almost half of the calculated twenty-four hour requirement) than the following doses, in order rapidly to build up the concentration.

Fluids given parenterally, inhalations of oxygen and blood transfusions were administered freely when symptoms indicated their use. Specific antipneumococcus rabbit serum was given intravenously to patients not responding satisfactorily to chemotherapy after twenty-four to forty-eight hours of treatment.

ANALYSIS OF DATA

Of the 731 children studied, 54 per cent were boys and 46 per cent girls; 60 per cent were white and 40 per cent Negro. The racial incidence was in direct proportion to the total admissions to the hospital. It

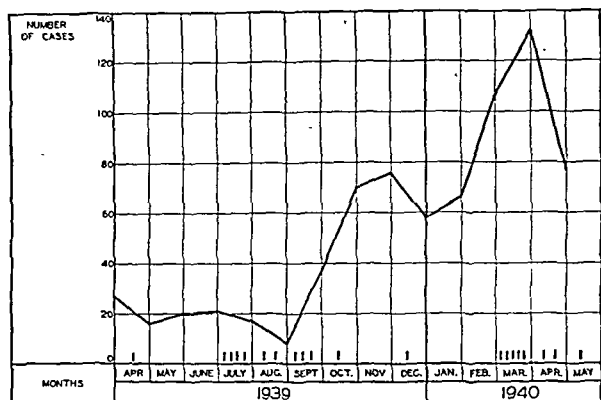


Chart 1.—Monthly incidence of pneumonia, April 1939 to May 1940.

was of interest to note, however, that only 20 per cent of the deaths occurred in Negro children.

Diagnosis of lobar pneumonia and bronchopneumonia was made as accurately as possible by physical examination and roentgen studies. Forty-five per cent of the patients were classified as having bronchopneumonia and 55 per cent as having lobar pneumonia. Sex and race bore no relation to the incidence of the disease (table 1), but the expected variation with age occurred. In the group aged 1 to 2 years 68 per cent had bronchopneumonia, while in the group over 4 years of age 72 per cent had lobar pneumonia.

There was a pronounced variation by months in the number admitted to the hospital. The greatest number of patients with pneumonia were admitted in March and April 1940 and the fewest in the summer months of 1939 (chart 1). Studies on the mortality revealed that approximately 50 per cent of the deaths occurred from July to October 1939 (inclusive), when only 11 per cent of the patients were admitted.

In approximately 78 per cent of the cases there were pneumococci in the laryngeal swab. Other organisms,

TYPES	UNDER 4 YEARS OF AGE	OVER 4 YEARS OF AGE
TYPE I	25%	75%
TYPE II	67%	33%
TYPE III	15%	15%
TYPE XIV	75%	27%

Chart 2.—Age distribution of most prevalent types of pneumococcal pneumonia.

notably streptococci and staphylococci, were identified in 17 per cent, while in approximately 5 per cent no bacteriologic diagnosis was made (table 2).

An attempt was made to associate the bacteriologic with the pathologic types of pneumonia. In approxi-

mately 60 per cent of the cases of pneumococcal pneumonia the involvement was lobar, and in 40 per cent it was bronchial, while in 47 per cent of the cases of non-pneumococcal pneumonia the involvement was lobar and in 53 per cent it was bronchial (table 3).

As has been pointed out in other reports, the types of pneumococci most common in cases of pneumonia in children differ from those most frequently associated with pneumonia in adults. In our study, the four types of pneumococci most frequently recovered were types I, VI, XIV and XIX; together they accounted for 45 per cent of the cases of single strain pneumococcal pneumonia or for 28 per cent of the entire series. The incidence of the various types is shown in table 4.

TABLE 4.—Types of Single Strain Pneumococci
(in Order of Frequency)

Type	Number of Cases	Percentage	Type	Number of Cases	Percentage
I.....	62	13.4	XIII.....	9	1.9
VI.....	61	13.2	XXI.....	9	1.9
XIV.....	48	10.4	VIII.....	8	1.7
XIX.....	36	7.6	X.....	6	1.3
V.....	30	6.5	XVI.....	6	1.3
IV.....	29	6.3	XI.....	5	1.6
VII.....	25	5.4	XVII.....	5	1.0
III.....	18	3.9	XXII.....	4	0.86
XXIII.....	18	3.9	XXX.....	3	0.65
XV.....	17	3.7	XXXI.....	3	0.65
II.....	12	2.6	XXIV.....	2	0.43
XXVIII.....	11	2.3	XII.....	1	0.21
XXXIII.....	11	2.3	XXV.....	1	0.21
XX.....	10	2.1	XXVII.....	1	0.21
IX.....	9	1.9	XXVIII.....	1	0.21
Total.....	461	99.23			

TABLE 5.—Relation of Pathologic Process to Most Frequent
Types of Pneumococci

Type of Pneumococci	Type of Pneumonia			
	Lobar		Bronchial	
	Number of Cases	Percentage	Number of Cases	Percentage
I.....	46	79.3	12	20.7
VI.....	29	50.0	30	50.0
XIV.....	35	70.0	16	30.0
XIX.....	16	46.0	19	54.0
VII.....	23	91.0	2	8.0
XX to XXXIII.....	23	39.0	39	61.0

TABLE 6.—Incidence of Otitis Media

Pneumococci	Type of Organism	Number of Cases
Type XIV.....		8
Type VI.....		5
Type XIX.....		4
Type XVIII.....		4
Type I.....		2
Type XXXIII.....		2
Mixed types.....		15
Streptococci, Staphylococci and others.....		10
No organism recovered.....		3
Total.....		53 (7.4%)

Pneumococci of types I, II, III, VII and XIV were found most frequently in cases of lobar pneumonia, while types above XX predominated in cases of bronchopneumonia. Pneumococci of types VI and XIX were found with equal frequency in cases of lobar pneumonia and of bronchopneumonia. The percentages of the types of pneumococci are correlated with the existing pathologic process in table 5.

There was a distinct relationship between the strain, or type, of pneumococcus and the age group. Type I was found most frequently (chart 2) in the older age group (in which 75 per cent of the patients were over

4 years of age and approximately 80 per cent had lobar pneumonia). Type XIV was definitely associated with the younger age group (85 per cent of the patients were under 4 years of age); one would therefore expect bronchopneumonia to predominate in type XIV pneumococcic infections, whereas in 69 per cent of our cases

TABLE 7.—Incidence of Empyema

Type of Organism	Number of Cases
Pneumococci	
Type I	18
Type V	2
Type VI	2
Type XIV	1
Staphylococci	3
Streptococci	2
Nonclassified	1
Total	29 (4% of 731)
Deaths from empyema	4 (14% of 29)

TABLE 8.—Sulfapyridine Treatment

Average dose required to reduce temperature to normal	3.21 Gm.
Average total dose for duration of disease	6.17 Gm.
Average duration of fever after starting of medication	21.6 Hr.
Normal temperature 12 hours after medication	34%
Normal temperature 24 hours after medication	66%
Normal temperature 48 hours after medication	95%

the involvement was classified as lobar. Approximately two-thirds of the patients with type VI and type XIX pneumonia were under 4 years of age and were equally divided among those with bronchopneumonia and those with lobar pneumonia.

Of the 731 cases under observation, cultures of blood obtained on admission were positive in only 32, or 4 per cent. Nine cultures revealed type I pneumococci, 7 staphylococci, 6 type XIV pneumococci, 3 streptococci, 2 type V, 2 type XXXIII, 1 type IV, and 1 type VII pneumococci, and 1 an unclassified pneumococcus. Many patients showed definite clinical evidence of sepsis, but 17 with positive blood cultures had no symptoms of bacteremia and were discharged from the hospital within eight days after admission.

TABLE 9.—Deaths

Type of Organism	Number of Cases
Deaths in first 24 hours	9
Deaths during treatment	9
Deaths on subsequent hospitalization	2
Pneumococci	
Type I	1
V	1
XI	1
XIV	1
XIX	1
XIV and XV	1
VI and XXXIII	1
Unclassified	4
Streptococci	8
Not typed	
Total	20 (2.73% of 731)

The symptoms of onset and the course of the pneumonia prior to institution of therapy in no way differed in this series from the usual picture. One noteworthy feature was the individuality of type I pneumococcus pneumonia. The patients with this type were more toxic; vomiting, abdominal pain, delirium and meningismus occurred more frequently. Empyema occurred

eighteen times more often with this type than with all other forms of pneumonia. The mortality, however, was not greater than for the less severe forms.

Many patients were dehydrated and ketotic on admission. Approximately 60 per cent had acetone in the initial specimen of urine. Albuminuria occurred in 6 per cent and in 25 per cent of those with type I pneumonia. The majority of the patients had white blood cell counts above 10,000, but 26 per cent showed leukopenia. Twenty-one per cent had a level of hemoglobin below 60 per cent. The lowest hemoglobin readings were those for patients with non-pneumococcic pneumonia.

The most common complication encountered in the 731 cases of pneumonia was otitis media. This disease was considered a complication only when the drum was bulging and paracentesis yielded a purulent discharge. Catarrhal otitis media was not included among the complications. Suppurative otitis media occurred in 53 cases (7.4 per cent); the incidence was greatest in the younger age groups. Approximately 10 per cent of the children below 4 years, as compared with 3.5 per cent of those above 4 years, had this complication. Surgical intervention (other than paracentesis) was

TABLE 10.—Mortality of Pneumonia in Children

Age, Years	Type of Pneumonia	Collected by Abt, 1926		Cook County Hospital, 1938		Cook County Hospital, 1939-1940	
		Cases	Percent age of Deaths	Cases	Percent age of Deaths	Cases	Percent age of Deaths
1-2	Bronchial	50	49.0	96	14.0	142	6.3
	Lobar	77	15.6	32	0.0	66	6.0
		127	29.0	128	11.0	208	6.25
2-4	Bronchial	15	27.0	74	5.4	96	3.2
	Lobar	81	6.2	26	7.5	90	3.2
		96	19.4	100	6.0	186	0.0
Over 4	Bronchial	43	40.0	105	5.7	94	0.0
	Lobar	170	2.8	108	2.8	243	0.4
		219	10.0	213	4.2	337	0.3
Total		442	15.0	441	6.6	731	2.7

not required. The types of causal organisms are shown in table 6.

The second most frequent complication and the one of greatest severity was empyema. It occurred in 29 cases, or 4 per cent of all that were studied, and in 18 cases (62 per cent) of type I pneumococcus pneumonia. The types are shown in table 7. Bacteriologic examination of the empyema fluid offered an excellent opportunity for study of the accuracy of the typing from pharyngeal swabs. In 18 cases, the organism recovered from the empyema fluid corresponded to that previously recovered from the sputum. In 4 cases pneumococci (types III, V and IX and mixed types) had been reported in the specimen of sputum, but the pleural exudate in 2 contained streptococci and in 2 staphylococci. On the other hand, staphylococci were recovered from the throat in 1 and streptococci in 2 cases in which there later developed type I pneumococcus empyema. Pneumococci of types XIX and XXI, respectively, were found in the sputum in 2 cases of type I pneumococcus empyema, and pneumococci of type XIX were found in the sputum in 1 case of type V pneumococcus empyema. Using this small series as a test of the efficiency of sputum typing, in view of the fact that one third of the cases of pneumonia resulting in empyema were incorrectly diagnosed, one might conclude that sputum typing in our series was only 65 per cent accurate.

Among the 29 empyema patients 4 (14 per cent) died. One of these was a mongolian idiot whose blood culture showed pneumococci of type XIV. One had streptococcal sepsis secondary to mastoiditis, and another, with type V pneumococcus pneumonia, died on the day of admission. From the fourth child, a 2 year old infant with severe sepsis, a few cubic centimeters of pus was aspirated shortly before death; no bacteriologic report was received for this child. There seemed to be no benefit from chemotherapy after the empyema was established.

As has been previously stated, there was no attempt to alternate types of therapy in our series of cases. Sulfapyridine was used alone in 87 per cent and in conjunction with specific serum in 2.6 per cent; nonspecific therapy was used in 10.2 per cent. The average amount of sulfapyridine required to reduce the temperature to normal was 3.21 Gm. and the average total dose 6.17 Gm. The typical response, so well known now, was obtained in the majority of the cases. Of about 200 sulfapyridine-treated patients whose febrile response was analyzed, 34 per cent reached and maintained a normal temperature within twelve hours after the initiation of treatment, 66 per cent within twenty-four hours and 95 per cent within forty-eight hours (table 8).

The mild unfavorable reactions reported by other authors were encountered in our series. In 17 per cent of cases vomiting was of sufficient severity to be recorded on the nursing chart. It in no way interfered with the efficacy of the treatment, however, and was more annoying than it was serious. Hematuria due to irritation by acetylsulfapyridine crystals was recorded in 3.6 per cent of the cases. The urine cleared when the drug was discontinued. Acute cerebral manifestations were seen in approximately 2 per cent; these varied from coma to confusion and to delirium. In a few cases rash due to the drug was seen, and in 1 case hemolytic anemia occurred. No death could be attributed to the chemotherapy.

Twenty of the 731 children died, with a resulting mortality of 2.73 per cent. Nine died within the first twenty-four hours after admission. Two children were discharged from the hospital apparently well but returned a few weeks later; 1 died from multiple cerebral thromboses, and the other had a thrombosis of the inferior vena cava. The 9 children who died within the first twenty-four hours in most instances had terminal pneumonia on admission and died before any therapy could be instituted. The remaining 9 (1.33 per cent) died during treatment. All but 1 of the children who died were under 4 years of age; 12 were between 1 and 2, 5 were 3 and 1 was 5. Eight had lobar pneumonia and 10 bronchopneumonia, and 2 had a chronic interstitial type of pneumonia. The pathologic diagnosis was established by autopsy on 12. The types of organisms in the fatal cases are shown in table 9. Three of the deaths were of mentally defective children. It is interesting to note that only 1 death of a child with proved type I pneumococcus pneumonia occurred.

The 2.73 per cent mortality rate for the 731 cases presented was compared with statistics of previous years. In table 10 the mortality rates of a collected series cited by Abt in 1926 are compared with that for the Cook County Hospital in 1938 prior to specific therapy. In 1926, before the free use of fluids and blood transfusions, Abt showed that the mortality of children over 1 year of age for all types of pneumonia was 15 per cent and for lobar pneumonia 7 per cent. After

the advent of better general measures in the care of patients with pneumonia, in 1938, the mortality in the same age group was 6.6 per cent for all pneumonias and 3 per cent for lobar pneumonias.

SUMMARY

1. Of 731 cases of pneumonia in children aged 1 to 13 years, pneumococci were demonstrated in 78 per cent.
2. Pneumococci of types I, VI, XIV and XIX were the ones most frequently found.
3. Administration of sulfapyridine was the sole therapeutic measure in 87.1 per cent of the cases; serum and sulfapyridine were used in 2.6 per cent, and non-specific therapy was employed in 10.2 per cent.
4. Otitis media occurred in 7.4 per cent of the cases. It occurred most commonly in younger children and in association with type XIV pneumococcus infections.
5. Empyema occurred in 4 per cent of the cases. Type I pneumococci were recovered from the pleural exudate in 62 per cent.
6. The mortality rate was 2.73 per cent. When 2 children who died on readmission and 9 who died within the first twenty-four hours were excluded, the mortality rate was 1.33 per cent.
7. Type I infections presented the most severe symptoms and were most commonly complicated by empyema, but they had no higher a fatality rate than infections of other types.
8. Complications of treatment with sulfapyridine were encountered but were mild and did not interfere with the efficacy of the treatment.

TREATMENT OF THE MENOPAUSE

EVALUATION OF ESTROGEN IMPLANTATION

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During the past few years, the endocrine treatment of the menopause syndrome has become established on a firm, rational basis. This has been made possible by studies of numerous investigators clarifying the hormonal mechanism responsible for the menopausal symptoms and by the researches of the sterol chemists which made available highly potent preparations of ovarian hormones. The traditional concept of the menopause as an aberration of somatic function, predominantly psychogenic in origin and requiring only sedation and psychotherapy, has given way to the realization that the menopausal symptoms are primarily a manifestation of a hormone deficiency caused by a waning or cessation of ovarian activity and that rational therapy should consist of supplying the patient with the hormone she lacks. The therapeutic results obtained with estrogens in the menopause constitute one of the most gratifying and dramatic achievements of modern medicine. However, by virtue of the fact that administering estrogens is substitution therapy, the problem does not end with

Mr. A. Austin Salmon performed the gonadotropic hormone assays. From the Gynecological Service of Dr. S. H. Geist, Mount Sinai Hospital.

The materials used in this investigation were supplied by the Schering Corporation, Bloomfield, N. J., and Ciba Pharmaceutical Products, Summit, N. J.

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relief of the symptoms, since almost invariably discontinuation of the estrogens results in a recurrence of the symptoms. One must, therefore, make provision for adequate maintenance therapy if the patient is to be kept symptom free. The necessity for prolonged treatment focused attention on the problem of determining the most efficient method of administering estrogens.

There is considerable evidence which appears to indicate that the high dosage of estrogens required to relieve menopausal symptoms is, in great part, attributable to the rapid absorption and excretion of the hormone. To achieve a satisfactory therapeutic effect in a patient with an advanced degree of estrogen deficiency, it is necessary to administer injections of a solution of the hormone in oil, at frequent intervals, for periods of several weeks. Aside from the inconvenience caused the patient by the necessity for frequent injections, there is the additional factor of expense which places this form of therapy beyond the means of many patients. In the interests of economy and the patient's comfort, it would obviously be highly advantageous if one could administer the hormone in a form which would provide her, at a single administration, with a supply adequate for her needs for several months.

To this end we have been experimenting for five years with a variety of methods of administering estrogens. In 1938 we began a series of studies with the subcutaneous implantation of loose crystals of estradiol and obtained encouraging results.¹ Since then we have performed implantations in a total of 180 cases with either loose crystals or compressed pellets of various synthetic estrogens, androgens and combinations of the two. We present here the results of our experience with this method of estrogen administration.

LITERATURE

Deanesley and Parkes² in 1937 were the first to report the implantation method of administering sterol sex hormones in animals. In the following year, Bishop³ reported the implantation of a 14 mg. compressed pellet of theelin in a 20 year old surgical castrate and noted that the "hot flush frequency" curve began to descend in about one week and that, at the end of four weeks, the flushes began to increase again. Shortly thereafter, we¹ reported complete relief of menopausal symptoms, for as long as ninety-eight days, in a series of 10 cases in which implantations were made with loose crystals of α -estradiol. In subsequent reports, prolonged therapeutic effects following implantation with compressed pellets (46 cases), as well as loose crystals (55 cases), were described.⁴ It was also shown that "by means of the implantation of crystals of α -estradiol and α -estradiol benzoate, it is possible to achieve a strikingly more prolonged inhibition of the hypophysis in postmenopause and ovariectomized women than can be obtained by injection of comparable amounts of estrogenic compounds in solution in oil."⁵ At the Scientific Exhibit of the American Medical Association, held in New York in June 1940, our group presented the results of estrogen implantation in a series of 126 cases. At that time, good therapeutic effects were noted, in some cases for as long as twelve months. In the same year, Bennett, Biskind

and Mark⁶ reported a series of 21 cases in which multiple (3 to 10) pellets of estrone were implanted. Eighteen patients were relatively free of symptoms for periods of from two to fourteen weeks following a single implantation with from 3 to 10 pellets weighing 5 to 6 mg. each.

PROCEDURE

In order to appraise the therapeutic value of estrogen implantation accurately, we formulated a series of questions designed to cover the phases of the problem which are of clinical interest. These are:

1. Is implantation more efficient than other methods of estrogen administration?
2. What is the most effective estrogenic compound?
3. What is the most effective method of implantation (compressed pellets or loose crystals)?
4. What is the optimal dose?
5. Are there any undesirable clinical side effects?
6. What is the effect of prolonged estrogenic stimulation on (a) the genital tract, (b) the breasts and (c) the tissues in contact with the implanted hormone?

The following studies, designed to supply answers to these questions, were undertaken:

1. *Clinical Evaluation of Efficiency.*—The duration of symptomatic relief resulting from estrogen implantation was compared with the results of administration, to a control group, of similar amounts of estrogens of the same chemical constitution, in solution in oil.
2. *Objective Criteria of Efficiency.*—Because of the protean character of symptoms of the menopause and the individual variations in subjective evaluation of symptoms, we felt that, in addition to a clinical appraisal, it was imperative that some objective criteria of estrogen activity be used to estimate the efficiency of the estrogen implantation.
- The criteria employed were: (a) the duration of estrogenic effects on the endometrium and vaginal mucosa (as revealed by endometrial and vaginal biopsies and vaginal smears); (b) the duration of pituitary inhibition (as determined by excretion of the gonadotropic hormone).
3. With these criteria, the efficiency of α -estradiol, α -estradiol benzoate, α -estradiol dipropionate, and estrogens in oil were compared.
4. Employing the same standards, we conducted a comparative study of the merits of implanting the estrogens in the form of loose crystals and compressed pellets.
5. The rate of absorption of the hormone was determined by excision of the pellets at varying intervals after implantation.
6. Histologic (biopsy) studies of the endometrium and vaginal mucosa were performed and the tissues surrounding the implanted hormone were excised, at varying intervals after the implantation, to determine whether any abnormal proliferation had been induced.
7. The breasts were examined periodically for evidence of abnormal stimulation and neoplasms.

MATERIALS AND METHODS⁷

Our studies have been conducted on a series of 180 patients varying in age from 35 to 70 years, comprising instances of natural menopause and surgical and roentgen castration. The estrogens employed were α -estradiol, α -estradiol benzoate and α -estradiol dipropionate in the form of loose crystals and of compressed pellets.

Morphologic Studies.—Vaginal smears and biopsies were performed before implantation in every case; in cases of spontaneous and of roentgen menopause, preliminary endometrial biopsies were also taken. The vaginal smears were prepared by the aqueous fuchsin

1. Salmon, U. J.; Walter, R. I., and Geist, S. H.: *Science* **90**: 162, 1939.
 2. Deanesley, R., and Parkes, A. S.: *Proc. Roy. Soc., London*, **5B**, 124: 279, 1937.
 3. Bishop, P. M. F.: *Brit. M. J.* **1**: 939, 1938.
 4. Salmon, Geist and Walter.² Geist, Walter and Salmon.² Walter, Geist and Salmon.²
 5. Salmon, U. J.; Geist, S. H., and Walter, R. I.: *Proc. Soc. Exper. Biol. & Med.* **43**: 424, 1940.

6. Bennett, H. G., Jr.; Biskind, Gerson, and Mark, Jerome: *Am. J. Obst. & Gynec.* **39**: 504, 1940.
 7. *Technic of implantation:* Pellets were implanted, subcutaneously, through a trocar; crystals, through a small incision in the skin of the thigh. For details of technic, the reader is referred to previous publications. Salmon, Walter and Geist.² Geist, Walter and Salmon.¹²

method.⁸ Vaginal biopsies were taken from the lateral wall of the upper two thirds of the vagina; endometrial specimens were obtained with the suction curet and stained with hematoxylin and eosin.

Vaginal smears were taken two or three times a week during the first two weeks after implantation; thereafter at intervals of one to two weeks. Vaginal biopsies, in the majority, were taken at intervals of two to eight weeks; material for endometrial biopsies were not taken uniformly from all patients. In a few selected cooperative patients suction curettages were performed at two week intervals; in others, at four to eight week intervals. One patient had a series of twelve biopsies taken during a period of seven months.

Gonadotropic Hormone Studies.—Urinary gonadotropic hormone extracts were prepared by a modification of the acetone precipitation method.⁹ In 37 cases, assays were performed on twenty-four and forty-eight hour specimens for from six to nine consecutive days preceding the implantation; after the implantation, in 25 cases, gonadotropic assays were done at intervals of from seven to fourteen days; in 12 of the 37 cases, assays were performed continuously on

TABLE 1.—Therapeutic Results of Estrogen Implantation in One Hundred and Twenty-Six Cases

Percentage of Cases Unimproved	Percentage* of Cases Symptom Free for							
	1 Mo.	2 Mos.	3 Mos.	4 Mos.	5 Mos.	6 Mos.	9 Mos.	12 Mos.
5.5	94.5	94.5	87	82	71	63	37	33

* The percentage figures beyond four months were calculated on the basis of the number of patients observed for the specified length of time.

forty-eight hour urine specimens for periods varying from thirty to two hundred and seven days after the implantation.

CLINICAL RESULTS

In table 1 are shown the clinical results observed in 126 patients following various types of estrogen implantation. It will be noted that 5.5 per cent of the patients were given no relief by the implantation; that 94.5 per cent were symptom free two months after the implantation, that at the end of four months 82 per cent, at the end of six months 63 per cent, and at the end of twelve months 33 per cent were still symptom free. The patients in the latter group are still being observed; some are still symptom free at the end of two years.

In table 2, the clinical results obtained with three chemically different estrogens, administered in the form of implants of crystals, pellets and injections of estrogens in oil, are shown.

Estradiol Crystals.—The total number of patients implanted with estradiol crystals was 42. These included 19 in natural menopause, 5 roentgen castrates and 18 surgical castrates. The dosage was varied from 5 to 50.6 mg.

Seventeen patients were implanted with doses varying from 5 to 10 mg. The duration of symptomatic relief varied from two to upward of twenty-four months. All the patients in this group were symptom free for a minimum of two months. At the end of twelve months, 40 per cent were still symptom free.

Twenty-three patients were implanted with doses varying from 20 to 30 mg. The duration of symptomatic relief varied from a minimum of five months to upward of twenty-four months. At the end of nine months, 44 per cent and, at the end of twelve months, 33.3 per cent of the patients were still symptom free. Two patients (not included in the table) who were implanted with 50 and 50.6 mg. of α -estradiol, respectively, were free of symptoms at the end of six and a half and seven months.

Estradiol Pellets.—In this group, 27 patients (17 in natural menopause, 4 roentgen castrates and 6 surgical castrates) were implanted with pellets varying in weight from 15 to 30 mg. Three patients experienced no relief. In the remaining 24, duration of relief varied from two to upward of twenty months. At the end of three months 85 per cent, at the end of six months 46 per cent and at the end of twelve months 25 per cent were still symptom free.

Estradiol Benzoate Crystals.—Nineteen patients (10 in natural menopause and 9 surgical castrates) were implanted with estradiol benzoate crystals in doses varying from 18 to 36.6 mg. One patient was not relieved. Of the remaining 18, the duration of relief varied from three to twelve months. All 18 patients were symptom free at the end of three months. At the end of six months 37 per cent and at the end of twelve months 7 per cent were still symptom free.

Estradiol Benzoate Pellets.—Twenty-two patients (9 in natural menopause, 4 roentgen castrates and 9 surgical castrates) were implanted with pellets of estradiol benzoate, varying in weight from 25 to 50 mg. Three patients experienced no relief. The duration of relief reported by the remaining 19 patients varied from two to seventeen months. At the end of three months 64 per cent, at the end of six months 50 per cent and at the end of twelve months 24 per cent were still symptom free.

Estradiol Dipropionate Crystals.—Twelve patients (5 in natural menopause, 3 roentgen castrates and 4 surgical castrates) were implanted with estradiol dipropionate crystals in doses varying from 18 to 25 mg. The duration of relief of symptoms varied from two to thirteen months. At the end of three months 75 per cent, at the end of six months 33 per cent and at the end of twelve months 17 per cent were still symptom free.

Estradiol Dipropionate Pellets.—Four patients were implanted with estradiol dipropionate pellets varying in weight from 24 to 31 mg. This group has been followed for only three months. All have remained symptom free during this period of observation.

INCIDENCE OF UTERINE BLEEDING

Estradiol Crystals.—No bleeding occurred in the patients implanted with the small doses of 5 to 10 mg. of estradiol crystals. Of the 23 patients in this series, 11 had had hysterectomies. Of the remaining 12 patients, 7 had one to five episodes of uterine bleeding. Bleeding occurred from one to five months after the implantation and varied from a moderate flow, lasting several days, to several weeks.

Estradiol Pellets.—Bleeding occurred in only 3 of the 21 patients with uteri in this group. The amount and duration of the bleeding was much less than in the group implanted with estradiol and estradiol benzoate crystals.

8. Salmon, U. J., and Frank, R. T.: Proc. Soc. Exper. Biol. & Med. 33: 612, 1936. Geist, S. H., and Salmon, U. J.: Am. J. Obst. & Gynec. 35: 392, 1939.

9. Modification of the Acetone Precipitation Method, to be published. Walter, Geist and Salmon."

Estradiol Benzoate Crystals.—Bleeding occurred in 7 out of 10 patients. In this group the bleeding was comparable in amount and duration to the bleeding in the estradiol crystal group.

Estradiol Benzoate Pellets.—No bleeding occurred in this group.

Estradiol Dipropionate Crystals.—Four of the 8 patients in this group, with uteri, had bleeding episodes which were comparable in amount and duration with the estradiol crystal (20 to 30 mg.) group.

Estradiol Dipropionate Pellets.—One out of the 4 patients in this group had a moderate amount of uterine bleeding six weeks after the implantation.

EFFECT OF ESTROGEN IMPLANTATION ON
THE ENDOMETRIUM

Pretreatment biopsies in all instances revealed various degrees of hypoplasia or atrophy. Postimplantation biopsies in the group implanted with crystals of estradiol or estradiol benzoate manifested proliferative changes within one week after implantation, and the endometrium progressed to a state of hyperplasia at the end of one month which persisted for approximately three and one-half months; moderate proliferation per-

months, the vaginal mucosa began to show regressive changes. Although the tempo of this retrograde process varied, in the majority the vaginal mucosa returned to the preimplantation state at approximately six to seven months after the implantation.

In the majority of the pellet group, the high level of full estrogenic stimulation was maintained for a shorter period, some patients showing complete regression at the end of three months. It is worthy of note that in a number of this group pellets weighing as much as 48 mg. were found encapsulated in the subcutaneous tissue at the time the vaginal mucosa revealed evidence of severe estrogen deficiency.¹⁰

GONADOTROPIC HORMONE EXCRETION STUDIES

A property of estrogens which lends itself to objective evaluation is the capacity of the hormone to inhibit the hyperactive hypophysis in estrogen-deficient women. Using the duration of hypophysial inhibition as a measure of estrogen activity, we have attempted to compare the relative effectiveness of the various implanted estrogens. In previous communications we¹¹ have reported that by means of the implantation of crystals of α -estradiol and α -estradiol benzoate it is possible to achieve

TABLE 2.—Duration of Symptomatic Relief After Various Types of Estrogen Implantation and Intramuscular Administration of Estrogens in Oil

Estrogen	Weight, Mg.	Number of Cases	Number of Cases Not Relieved	Percentage of Cases Symptom Free at End of							
				1 Mo.	2 Mos.	3 Mos.	4 Mos.	5 Mos.	6 Mos.	9 Mos.	12 Mos.
Estradiol crystals: Group A	5-10	17	0	100	100	70	70	56	56	53	40
Group B	20-30	23	0	100	100	100	100	100	80	53	50
Estradiol pellets	15-30	27	3	89	85	85	81	53	46	35	25
Estradiol benzoate crystals	18-30.6	19	1	95	95	95	82	56	37	15	7
Estradiol benzoate pellets	25-50	22	3	86	73	64	59	50	50	23	24
Estradiol dipropionate crystals	18-25	12	0	100	83	75	50	50	33	17	17
Estradiol dipropionate pellets	24-31	4	0	100	100	100	75				
Estradiol benzoate in oil	25	10	1	40	10	0					
Estradiol dipropionate in oil	25	8	1	25	0	0					

sisted for several months. In the majority of instances, the endometrium revealed regression to the preimplantation status at the end of approximately seven months.

In the group implanted with α -estradiol and α -estradiol benzoate pellets, the proliferative response in the endometrium was slower in development and less intense, hyperplasia being found in only 1 instance. Evidence of estrogenic stimulation in the form of moderate endometrial proliferation persisted for from four to six weeks, after which regressive changes were noted. The tempo of regression varied, the endometrium returning to the preimplantation status within from three to six months after the implantation.

EFFECT OF ESTROGEN IMPLANTATION ON
VAGINAL MUCOSA

Pretreatment vaginal biopsies and smears revealed, in all instances, various degrees of estrogen deficiency. Estrogenic effects were noted within four days after all types of implantations. The vaginal mucosa of those implanted with α -estradiol and α -estradiol benzoate crystals, however, revealed estrogenic effects somewhat earlier and of more intense degree than the group implanted with pellets of comparable weight and similar chemical constitution.

The high level of full estrogenic stimulation, as indicated by proliferative changes in the mucosa, was maintained, in the group implanted with crystals, for periods varying from three to four months. After four

a prolonged inhibition of the hypophysis of postmenopausal and castrated women. Further studies have shown that implanted crystals are strikingly more effective than pellets (of the same weight and chemical constitution) in inhibiting the hypophysis. Neither α -estradiol nor α -estradiol benzoate pellets were able continuously to inhibit the excessive excretion of gonadotropic hormone for longer than eight days. In contrast to this, patients who had been implanted with estradiol or estradiol benzoate crystals showed continuous inhibition for periods varying from fifty-seven to two hundred and eleven days.

EFFECT OF ESTROGEN IMPLANTATION ON
THE BREASTS

The majority of patients implanted with crystals noted a sensation of fullness of the breasts associated with swelling and tenderness of the nipples. Usually, this occurred at the end of the second or third week after the implantation. Examination of the breasts of all patients revealed a diffuse engorgement, as well as erection and redness of the nipples and areolas. The majority of the patients were of the opinion that the engorgement was similar, but rather more intense, than that which they had experienced preceding a menstruation period. These symptoms usually lasted for periods varying from two to four weeks. Breast engorgement occurred in relatively few of the patients

10. Geist, Walter and Salmon.¹² Walter, Geist and Salmon.¹³
11. Salmon, Geist and Walter.³ Geist, Walter and Salmon.¹²

implanted with pellets, and in these the symptoms were much less severe and of shorter duration. To date, in none of the implanted patients has there been any palpable evidence of neoplastic changes in the breasts.

LOCAL TISSUE REACTION TO ESTROGEN IMPLANTATION

The implantation sites of 38 patients were excised at periods varying from five days to fourteen months after implantation.

Capsule Formation About Implanted Pellets.—Pellets excised two months or longer after the implantation were found to be enveloped by a thick, avascular, fibrous capsule. The connective tissue adjacent to the implanted substance revealed a typical foreign body reaction.¹²

It is highly significant that in a number of instances, in spite of the presence of pellets varying in weight from 10 to 48 mg., in the subcutaneous tissue at the time of excision, endometrial and vaginal biopsies revealed histologic evidence of estrogen deficiency. Apparently, the fibrous capsules prevented absorption of the hormone in effective amounts.¹³

Tissue Reaction to Implantation of Crystals.—In contrast to the tissue reaction about the pellets described, no capsule was found at the site of implantation of the loose crystals. Microscopic examination revealed numerous tiny nodules, consisting of small central clear spaces divided by a fine connective tissue lattice-work surrounded by a zone of leukocytes, lymphocytes and foreign body giant cells.

RATE OF ABSORPTION OF ESTROGEN FROM IMPLANTED PELLETS

Nineteen patients (10 implanted with α -estradiol and 9 with α -estradiol benzoate) had the pellets excised at periods of time varying from five to two hundred and forty-five days after the implantation. In the α -estradiol group, the average absorption per day was 0.038 mg.; in the α -estradiol benzoate series, 0.027 mg. A slow rate of absorption is a desirable property, but it ceases to be an advantage if the rate of absorption becomes so slow that the physiologic requirements of the body are not met. This happens with both α -estradiol and α -estradiol benzoate pellets as a result of the formation of the fibrous capsule. The role of the capsule in retarding and finally preventing absorption of the hormone in effective amounts is stressed, since pellet implantation has been advocated in the treatment of the menopause.⁶ Although, as shown by these and other studies, the initial therapeutic results obtained with pellets are satisfactory, it should be borne in mind that absorption of the hormone in effective amounts ceases when only a small fraction of the pellet has been absorbed, so that, after several months, the patient retains an encapsulated pellet without deriving any therapeutic benefit from it.

EVALUATION OF INJECTIONS OF ESTROGEN IN OIL

A control series of 10 patients was given a single injection of 25 mg. each of α -estradiol benzoate and 8, 25 mg. of estradiol dipropionate, in solution in sesame oil. The effectiveness was measured by duration of symptomatic relief, as well as by the period of estrogenic effects on the endometrium and vaginal mucosa, and by suppression of gonadotropic excretion.

Two patients were only slightly relieved of their symptoms; the remaining 16 had symptomatic relief for periods varying from three to eight weeks. Estrogenic stimulation of the vaginal mucosa and endometrium varied from three to four weeks. Excretion of gonadotropic hormone was suppressed for periods varying from nine to eleven days. The brief duration of these estrogenic effects (both clinical and morphologic) stand in sharp contrast to the prolonged effects resulting from estrogen implantation.

PROPHYLACTIC IMPLANTATION OF ESTROGENS

Following the demonstration of the prolonged therapeutic effects of estrogen implantation, it seemed logical to use estrogen implantations prophylactically in women who were subjected to bilateral oophorectomy. During the course of a study of the psychic and somatic effects of ovariectomy, we found that not infrequently women have menopausal symptoms during the first postoperative week. That these symptoms are not psychogenic and actually constitute a somatic reaction to deprivation of estrogenic hormone is indicated by the fact that excessive excretion of gonadotropin (expressive of hyperactivity of the hypophysis) was found as early as three days after bilateral ovariectomy.¹⁴

A series of 36 patients was implanted with pellets and crystals of estradiol, estradiol benzoate and estradiol dipropionate, either at the time of oophorectomy or within a few days thereafter. The postimplantation period of observation in this series varied from three to twenty-four months. During the first three months after implantation in only 1¹⁵ of the thirty-six patients did symptoms develop. During the following nine months, 20 patients had very mild flushes. Only 6 of the 20 patients had symptoms that became severe enough to require additional estrogen therapy. Sixteen patients have continued to remain free of symptoms during the entire period of observation, which extended to twenty-four months.

Appraisal of the prophylactic value of implantation in these patients is made difficult by the fact that it is impossible to know in how many of these patients symptoms would have developed without estrogen therapy. However, it is significant that in a control series of 88 untreated patients, 26 per cent had symptoms at the end of the first postoperative week, the incidence mounting rapidly during the following six weeks, at which time 81 per cent had symptoms; at the end of sixteen weeks, 92 per cent had typical symptoms.

The convalescence of the implanted patients appeared to be smoother, the usual postoperative asthenia and depression being distinctly less in evidence.

EFFECT OF ESTROGEN IMPLANTATION ON DIABETES IN MENOPAUSAL WOMEN¹⁶

It has recently been reported that administration of estrogen improves the carbohydrate tolerance and decreases the insulin requirement of menopausal diabetic women.¹⁷ In a series of 18 menopausal diabetic

14. Walter, R. I.; Geist, S. H., and Salmon, U. J.: *Endocrinology* 27: 154, 1940.

15. Proper evaluation of the symptoms of this patient was made difficult by the fact that a myocardial infarction developed several days after operation. The flushes subsided when she recovered from the cardiac complication.

16. These studies have been performed in collaboration with Drs. Herbert Pollack, Seymour Goldgraben, L. Eisenstein and Charles Poole of the Department of Metabolism of the Mount Sinai Hospital.

17. Spiegelman, A. R.: *Am. J. M. Sc.* 200: 228, 1940. Mazer, Charles; Meranze, D. R., and Israel, S. L.: Evaluation of Constitutional Effects of Large Doses of Estrogenic Substances, *J. A. M. A.* 105: 257 (July 27) 1935. Patton, P. B.: *Weekly Roster & M. Digest* 31: 1201, 1936.

12. Geist, S. H.; Walter, R. I., and Salmon, U. J.: *Proc. Soc. Exper. Biol. & Med.* 43: 712, 1940.

13. Walter, R. I.; Geist, S. H., and Salmon, U. J.: *Proc. Soc. Exper. Biol. & Med.* 44: 314, 1940.

women whom we implanted with estrogens, only 1 showed any improvement in the carbohydrate tolerance and insulin requirement. The results of this study are being reported elsewhere in detail.

COMMENT

Clinical Evaluation of Effectiveness of Estrogen Implantation.—Before implantation, all the patients in the series had complained of the usual menopausal symptoms, the most prominent and constant of which were flushes. Other symptoms, such as vertigo, weakness, headaches, palpitation, nervousness, insomnia, pruritus vulvae, arthralgias and arthritis, were present in various combinations in different patients. Because of variations in the incidence and intensity of these symptoms and their variable response to therapy, it was found impossible to compare the therapeutic effectiveness of the administered estrogens with regard to amelioration of these symptoms. Therefore, because of the occurrence of flushes in all the patients and the ability of patients to keep an account of their frequency, the amelioration of this symptom was selected as an index of therapeutic effectiveness.

In many instances, relief of flushes occurred as early as twenty-four hours after the implantation. With the few exceptions who were not relieved at all, the majority were almost completely relieved of flushes at the end of one week. Many of the associated menopausal symptoms, namely headaches, dizziness and weakness, were relieved at the same time as the flushes. The symptoms most resistant to treatment were the arthralgias. In only a relatively small number of cases were these relieved. The most rapid therapeutic effects were noted in patients implanted with crystals.

It is interesting to note that the 7 patients who experienced no relief of symptoms after implantation all showed morphologic evidence of estrogenic stimulation. The therapeutic failure of the implantation in these cases draws attention to two important aspects of menopause therapy: first, that estrogens alone are, in some patients, therapeutically ineffective and that such patients frequently respond to androgens;¹⁸ second, that in a number of patients the persistence of symptoms can be traced to psychogenic factors. The incidence of initial failures encountered with the various types of implantations should not, therefore, be construed as a gage of their relative therapeutic merits, since the role played by psychogenic factors was not evaluated in these patients before the implantation.

A number of these refractory cases were subsequently investigated and found to present neuropsychiatric disorders which, in the opinion of the psychiatrists, may account for persistence of symptoms. Realizing the importance of evaluating the degree to which collateral psychosomatic phenomena may color the symptomatology before and after treatment, we have undertaken a series of psychiatric studies of this aspect of the menopause problem.¹⁹ The results of this investigation are to be reported in the near future.

At the beginning of this study, a number of questions were formulated which were designed to determine the practical value of estrogen implantation as a therapeutic measure. The results of these studies supply the answers to these questions.

1. *Is the implantation method more efficient than other methods of estrogen administration?* A survey of the therapeutic results two months after implantation reveals that all forms of estrogen implantation are indisputably superior to the intramuscular injection of comparable amounts of the hormone in oil. Thus, only 1 of the 18 patients treated with estrogens in oil was symptom free at the end of two months, whereas the percentage of symptom free patients in the implanted series at the end of two months varied from 100 (estradiol crystals) to 73 (estradiol benzoate pellets).

2. *What is the most effective estrogenic compound?* Inventory of the therapeutic results at the end of five months reveals that the α -estradiol crystals were the most effective of the three estrogenic substances employed. All the patients in this group were symptom free for five months, whereas in the others the percentage of symptom free patients at the end of five months varied from 50 to 56.

3. *What is the most effective method of implantation (crystals or pellets)?* Judged by (a) the degree and intensity of symptomatic relief, (b) the intensity and duration of estrogenic activity (as indicated by proliferative changes in the endometrium and vaginal mucosa) and (c) the duration of hypophyseal inhibition, estrogens in the form of loose crystals are more efficient than compressed pellets of the same chemical constitution and comparable weight.

4. *Are there any undesirable clinical side effects?* Effect on Breasts: Tenderness and pain in the breast and uterine bleeding were the only undesirable clinical effects noted. Both of these phenomena also occur, not infrequently, following other methods of estrogen administration. Furthermore, the breast reactions in the implanted patients were of short duration (approximately two to six weeks) and caused only mild discomfort.

Uterine Bleeding: The uterine bleeding, however, is a collateral effect which may be annoying to both the patient and the physician. In older women it may arouse fears of a uterine malignant growth. Furthermore, the possibility of a uterine malignant growth occurring coincidentally must be considered and excluded in each instance by thorough curettage. It is worthy of note that the highest incidence of bleeding (approximately 65 per cent) occurred in the patients implanted with the larger doses of estrogen crystals (25 to 30 mg.), whereas no bleeding occurred in the group of patients implanted with small doses of estrogen crystals (5 to 10 mg.). Apparently the incidence of bleeding mounts with an increase in the amount of hormone implanted and is evidently a function of the degree of estrogenic stimulation of the endometrium. The optimal dose obviously would be an amount which would give a maximal therapeutic effect with a minimal incidence of uterine bleeding.

5. *What is the optimal dose?* The results of these studies indicate that the optimal dosage lies between 10 and 25 mg. of α -estradiol crystals. Further studies are being conducted to define this dosage more accurately.

6. *What is the effect of prolonged estrogenic stimulation on (a) the genital tract, (b) the breasts and (c) the tissues in contact with the implanted hormone?* As indicated by the endometrial and vaginal biopsy studies, the implanted estrogens produce a prolonged and intense proliferative reaction in these tissues. It

18. Salmon, U. J.: J. Clin. Endocrinol. 1:162, 1941. Geist, S. H., and Salmon, U. J.: New York State J. Med., to be published.
19. This study is being conducted in collaboration with Drs. Lawrence Kubie, Samuel Atkin and Isidore Silbermann.

should be borne in mind that these proliferative effects were limited in duration and that the endometrium and vaginal mucosa spontaneously regressed in all cases to the preimplantation state of quiescence within six to seven months.

The question naturally arises as to whether the intense estrogenic stimulation may not possibly have a carcinogenic effect on the genital tract and breasts. For obvious reasons this question cannot, at this time, be answered categorically. If a neoplastic type of proliferation were induced as a result of the estrogen implantation, it is logical to expect that abnormal changes would occur during the period of maximal or, at any rate, active estrogenic stimulation. It is worthy of note, therefore, that during the course of this study, which covers a period of more than two years and which exceeds the period of active estrogenic stimulation by many months, evidence of neoplasia was not found either in the vaginal mucosa or in the endometrium.²⁰ Furthermore, no evidence of neoplastic proliferation was found in the tissue contiguous with or adjacent to the implanted estrogens, and in no instance was there any clinical evidence of neoplastic changes in the breasts.

On the basis of the results of this study, it would appear that implantation is a practical, efficient and safe method of administering estrogens and that the implantation of estrogens, at the time of bilateral oophorectomy, is a prophylactic measure of great value because of its somatic as well as its psychotherapeutic effects.

SUMMARY AND CONCLUSIONS

1. Implantation with loose crystals and compressed pellets of α -estradiol, α -estradiol benzoate and α -estradiol dipropionate was carried out on a series of 180 patients.

2. A control series of 18 menopausal patients was given a single injection of comparable amounts of estrogen in solution in oil.

3. The efficiency of the implantation was evaluated on the basis of (a) degree and duration of symptomatic relief; (b) intensity and duration of estrogenic activity, as indicated by proliferative changes in the endometrium and vaginal mucosa, and (c) duration of hypophyseal inhibition, as indicated by suppression of gonadotropic hormone excretion.

4. Judged by the foregoing criteria, the implantation of estrogens in the form of loose crystals or compressed pellets is more efficient than the injection of comparable amounts of hormone in oil.

5. Loose crystals of α -estradiol and α -estradiol benzoate are more effective than the compressed pellets of the same chemical constitution. The longest period of symptomatic relief was obtained by the implantation of α -estradiol crystals.

6. Subcutaneous implantation of estrogens in the form of loose crystals of α -estradiol, in amounts varying from 10 to 25 mg., is a simple, safe and efficient method of administering estrogens in the treatment of symptoms attributable to estrogen deficiency resulting from surgical or roentgen castration or the natural menopause. It is also recommended as a prophylactic procedure at the time of bilateral ovariectomy because of its beneficial somatic and psychotherapeutic effects.

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BENIGN AND MALIGNANT GIANT-CELL TUMORS OF BONE

DIAGNOSIS AND RESULT OF TREATMENT

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All giant-cell tumors were considered at one time to be malignant lesions and were classified by the term "giant-cell sarcoma." As knowledge concerning their true nature increased, it became evident that some of them were benign lesions and curable by means of surgical removal. I believe that the term "giant-cell sarcoma," when used in reference to benign giant-cell tumor, has been partly responsible for the confusion that has existed in the classification and study of this particular group of bone lesions. In a previous publication I¹ suggested the use of the terms "benign giant-cell tumor" and "malignant giant-cell sarcoma" in an attempt to clarify the differentiation.

Although surgical treatment resulted in many cures of patients who had these tumors, I became wary in my prognosis for I found that occasionally there was recurrence of the lesion, and in some instances metastasis occurred. Some physicians concluded that meddlesome surgical intervention and irradiation were responsible for the transition of the benign group into the malignant group, whereas others believed that the malignant condition was present in the beginning but had not been recognized. In some cases in which the lesion has been long standing, a malignant change may occur and regions of typical benign giant cells, composing most of the tumor, may show smaller foci of malignant cells. The degree of malignancy in such instances apparently is of low grade and the prognosis correspondingly better than in such bone lesions as osteogenic sarcoma. The radiologists have discovered this type of tumor to be radiosensitive and have reported cures after irradiation. Pathologists have found similar microscopic tissue present in cases of osteitis fibrosa cystica, of giant-cell tumor and in the generalized skeletal disease found in hyperparathyroidism.

The physician in charge of the patient on whom a diagnosis of tumor of the giant-cell type has been made therefore must take into consideration several factors in differentiating the true nature of the lesion. Invariably the roentgenograms give him the greatest aid by demonstrating the size, rapidity of growth, location, osteoclastic character, penetration or invasion of soft tissue and the earliest evidence of pulmonary metastasis. Roentgenographic examination of the thorax to exclude possible pulmonary metastasis is our routine procedure. The chemist further assists him in determining the concentration of calcium in the serum when greater than 9 to 11 mg., of phosphorus when less than 3 mg., and of phosphatase when greater than 5 units per hundred cubic centimeters and presence of excessive calcium in the urine by the Sulkowitch test, the type of lesion found in hyper-tumor of the parathyroid may be discovered on palpation or when an exploratory operation is performed on the parathyroid glands. In the work at the Mayo Clinic it has been our habit to

From the Section on Orthopedic Surgery, Mayo Clinic.

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1. Meyerding, H. W.: Treatment of Benign Giant Cell Tumors, *J. Bone & Joint Surg.* 18: 823-841 (Oct.) 1936.

20. Geist, S. H., and Salmon, U. J.: *Am J Obst & Gynec* 41: 29, 1941.

cooperate closely with the roentgenologist, the pathologist, the chemist and the endocrinologist so that we may give our patient an accurate diagnosis, which is essential to the institution of the proper method of treatment and which offers him the best prognosis in this particular lesion.

TABLE 1—Benign and Malignant Giant-Cell Tumors, 1916-1940 Inclusive

Age, Years	Sex		Total Patients	
	Male	Female	Number	Per Cent
10-19	14	15	29	23.4
20-29	13	20	33	26.6
30-39	12	20	32	25.8
40-49	6	11	17	13.7
50-59	9	0	9	7.3
60-69	2	1	3	2.4
70-79	1	0	1	0.8
Total	57	67	124	100
Youngest, years	12	10	10	
Oldest, years	72	60	72	
Mean, years	33.6	29.9	31.6	

In large medical centers the study and analysis of the accumulated material permit the publication of much useful information concerning the diagnosis, treatment and prognosis, thus making it available to the general practitioner and surgeon. No one physician in private practice could expect to see, during a natural span of life, a sufficient number of patients who have rare bone lesions to permit him to obtain enough material on which to base conclusions. The generalized bone lesions of hyperparathyroidism, epulis of the jaw and osteitis fibrosa cystica, although all doubtless are allied closely to this lesion, are not included here as typical giant-cell tumors of benign or malignant nature, which are commonly located in the region of the epiphysis. The Bone Sarcoma Registry recognizes, in the recent classification, a malignant group and a benign epiphyseal giant-cell tumor group.

Of the 124 patients with giant-cell tumor seen at the Mayo Clinic during the quarter of a century from

TABLE 2—Benign and Malignant Giant-Cell Tumors, 1916-1940 Inclusive

Situation	Sex of Patients		Total Patients	
	Male	Female	Number	Per Cent
Femur	19	23	42	33.9
Tibia	16	14	30	24.2
Humerus	5	3	8	6.5
Ilium	4	3	7	5.6
Ulna	2	4	6	4.8
Radius	2	2	4	3.2
Fibula	2	3	5	4.0
Lumbar region	1	3	4	3.2
Sacrum	1	1	2	1.6
Scapula	1	1	2	1.6
Rib	0	2	2	1.6
Pubis	0	0	1	0.8
Cervical vertebra	1	0	1	0.8
Thoracic vertebra	1	0	1	0.8
Oscleas	0	1	1	0.8
Cuboid	0	1	1	0.8
Multiple	0	1	1	0.8
Total	57	67	124	100

1916 to 1940 inclusive, in 101 the lesions were benign and in 23, or 19 per cent, they were malignant. Simmons² in his study found that, in 8 per cent of the cases of giant-cell tumor, in which the treatment was conservative, metastasis subsequently developed. Coley³ reported a series of 50 cases in which the diagnosis

was benign giant-cell tumor and subsequently 10 patients, or 20 per cent, died of metastasis. The importance of a thorough and expert pathologic examination is therefore obvious, and it has been our practice to have these tumors examined by means of frozen section technic at the time of operation and rechecked in permanent sections later. By this means we have been able to differentiate the benign from the malignant lesion and thus govern the choice of treatment to be employed. It must be remembered that not all giant-cell tumors are suitable for surgical treatment and that in certain instances irradiation is the method of choice. I am convinced that the clinical diagnosis and roentgenologic diagnosis may not always be correct and that, although a high percentage may be correct when made by the expert, it is far better to have the corroboration of the pathologist's diagnosis.

BIOPSY

I further believe that the added advantage of a microscopic diagnosis far offsets any danger which may be ascribed to biopsy. In 4, or 3 per cent, of our cases

TABLE 3—Benign and Malignant Giant-Cell Tumors, 1916-1940 Inclusive

Duration in Years	Patients	
	Number	Per Cent
Less than 1	59	47.6
1-2	32	25.8
2-3	8	6.5
3-4	8	6.5
4-5	3	2.4
5-6	1	0.8
6-7	4	3.2
7-8	1	0.8
8-9	1	0.8
9-10	1	0.8
10 and more	5	4.0
Not stated	1	0.8
Total	124	100

herein reported, biopsy alone was done and the patient returned home to carry out treatment there. Three lesions were benign and one was malignant. All patients in this group were living five or more years after biopsy.

Table 1 shows the distribution of patients by age and sex, table 2 the location of the tumor, table 3 the duration of symptoms and table 4 the previous treatment of the patients.

IRRADIATION

We do not practice the routine preoperative irradiation of all patients who have tumor of bone nor do we practice a period of watchful waiting, as during such time metastasis may occur and thus the opportunity of a cure may be lost. Rather it is our aim to establish a diagnosis, to determine the benignancy or malignancy of the tumor and to adopt the method of treatment which in our experience has proved most satisfactory. Therefore a detailed history and careful laboratory and roentgenologic studies permit a preliminary diagnosis, after which the patient is informed of our desire to verify our opinion by examining a section of tissue microscopically and consent is obtained to proceed with treatment that may be indicated. In those cases in which the lesion is inoperable, irradiation is carried out.

In our practice it is evident that irradiation has won a distinct place in the treatment of patients who have these tumors, since 23, or 19 per cent, of our series, were so treated, and it is gratifying indeed to see some of the excellent results that have occurred in appar-

² Simmons, C. C. Primary Malignant Bone Tumors. Differential Diagnosis—Its Importance in the Selection of Treatment. *Am. J. Surg.* 27: 19-25 (Jan.) 1935.
³ Coley, W. B. Prognosis and Treatment of Giant Cell Sarcoma. Based on a Further Study of End Results in Sixty Nine Cases. *Ann. Surg.* 56: 641-665 (Nov.) 1927.

ently rather hopeless cases. We have kept an open mind regarding the relative value of various methods of treatment. We believe that in the majority of instances surgical treatment offers by far the most rapid and certain cure. Occasionally soft and osseous tissues have been damaged by preliminary irradiation with resultant actinodermatitis and ulceration, which make surgical treatment difficult or inadvisable. Certainly irradiation of patients who have tumor of bone should be supervised by experts in roentgen therapy. I believe that irradiation used alone or in combination with surgical treatment will prove of increasing value in selected cases of benign giant-cell tumor and of malignant giant-cell sarcoma.

EXCISION BY CURETTAGE

Curettage of a giant-cell tumor should consist of complete excision, and in order to accomplish this it is necessary to have a dry field in which to work and a large enough opening so that the magnitude of the lesion may be determined and every particle of tumor tissue removed. After excision by curet, the wound

TABLE 4.—*Benign and Malignant Giant-Cell Tumors, 1916-1940 Inclusive*

Procedure Elsewhere	Patients	
	Number	Per Cent
Cast, traction or brace.....	13	22.4
Heat, manipulation or massage.....	8	13.8
Excision, curettage (bone graft, 1).....	10	17.4
Excision, curettage and irradiation.....	9	15.5
Irradiation.....	9	15.5
Exploration.....	2	3.5
Tonsilectomy for arthritis.....	1	1.7
Bed for fracture.....	1	1.7
Aspiration.....	1	1.7
Section of eighth intercostal nerve for pain.....	1	1.7
Treatment for sarcoma.....	1	1.7
Treatment for syphilis.....	1	1.7
Serum.....	1	1.7
Total.....	58	100
Amputation advised elsewhere.....	5	

should be wiped dry and washed thoroughly with physiologic solution of sodium chloride or mild antiseptic solution; the surgeon should bear in mind that the mechanical action of the fluid will wash out invisible particles. Phenol then is swabbed over the dry surface and followed by the use of sponges dampened with alcohol, which should aid in eliminating the danger of remaining tumor tissue. The tissues then are closed snugly layer by layer and pads and compression bandage applied. Ordinarily there will be little bleeding. The use of drains may lead to infection and a prolonged convalescence. Amputation has been found necessary in those cases in which the tumor was large with ulcerating dermatitis or in which infection had occurred. I have used packs in the cavity after removal of the large tumor, sutured the wound snugly and then removed the packs in a second operation, after which homogenous bone was inserted. A large cavity is never drained after excision. This method of excision alone has been used with 100 per cent good results; in 7 cases, in all of which the lesion was benign and in which the patient was traced five or more years, he had lived five or more years. This method is more obviously adapted to the smaller tumors in the benign group.

EXCISION AND IRRADIATION

Excision followed by irradiation has gained in popularity, and in our series it was employed in 23, or 19 per cent, of the cases of the entire group (table 5). Certainly the surgeon who has done his utmost in removing the tumor but is in doubt about the com-

pleteness of the excision is justified in employing post-operative irradiation that may insure a good result. This method, when used in cases in which there is a low degree of malignancy, should show improved prognoses. In the group in which the lesion was benign, 16 patients were operated on five years or more before

TABLE 5.—*Benign and Malignant Giant-Cell Tumors 1916-1940 Inclusive*

Procedure	Patients	
	Number	Per Cent
Biopsy.....	4	3.2
Irradiation with or without biopsy.....	23	18.5
Excision alone.....	8	6.5
Excision and irradiation.....	23	18.5
Excision and bone graft.....	21	17.0
Excision, bone graft and irradiation.....	6	4.8
Resection.....	3	2.4
Amputation (primary, 20) (following excision, 5) (bone graft, 2).....	27	21.8
No treatment—diagnosis only.....	9	7.3
Total.....	124	100

this study was made, all of whom were traced and were living when the study was made, thus giving a five year survival rate of 100 per cent. In the group in which the lesion was malignant, there were 5 patients on whom this procedure was performed five years or more before the study was made. All of them were traced and 3, or 60 per cent, had lived five years or more.

EXCISION AND BONE GRAFTING

An increasingly valuable method of treatment and one that requires especial technical knowledge is the complete excision of the tumor followed by immediate filling of the defect with bone grafts. This method assures more accurate diagnosis, since it permits microscopic diagnosis from frozen tissue. The tumor is removed entirely and the cavity filled with autogenous bone grafts, thus assuring the most rapid and accurate filling of the defect. Indeed the patient has a minimal loss of time and in most instances is assured an excellent functional result. During recent years excision with bone grafting has been my favorite method of treatment of patients who had giant-cell tumor of

TABLE 6.—*Benign and Malignant Giant-Cell Tumors, 1916-1935 Inclusive*

Classification	Diagnoses, Patients *	Patients Traced	Lived Five Years or More	
			Patients	Per Cent of Traced Patients
Benign.....	69	63	61	96.8
Malignant.....	20	20	13	65.0
Total.....	89	83	74	89.2

* Inquiry as of 1941. The five year group comprises the patients whose diagnoses were made five years or more prior to the time of inquiry; that is, 1935 or earlier.

bone, and needless to say it has given the most gratifying results. The larger tumors, which have challenged the surgeon in the past, are now approached with greater confidence as he knows he will often save the limb and the patient will obtain a good result, which was not possible prior to insertion of grafts. When I wish to support a neighboring joint surface, as in the region of the knee, I employ thick sections of the tibia as struts, after which multiple shavings of bone are used to fill in the interspaces. Blood coagulates rapidly about such a mass of living bone and the most favorable conditions exist for the formation of new bone.

Indeed, in cases in which operation is performed properly the rapidity of the filling in of these defects has been astounding.

Although it is a technic employed more often in recent years, 21, or 17 per cent, of the patients in our

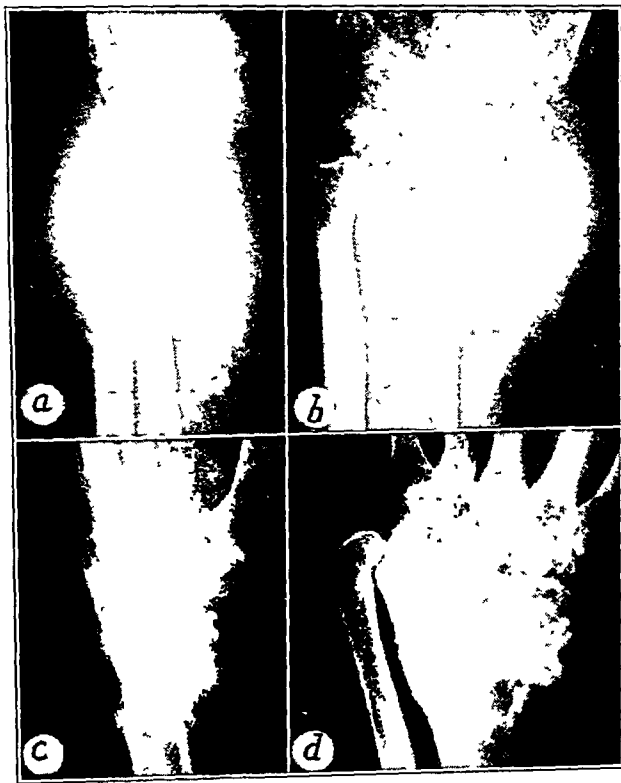


Fig 1—*a*, lateral view showing giant cell tumor of distal end of left radius (one year's duration), which was taken on June 8, 1937, eight months after curettage elsewhere; *b*, anteroposterior view, *c*, twenty six months after irradiation; *d*, anteroposterior view

series had excision and bone grafting. Of those who had benign lesions, 10 were operated on five or more years before this study was made; 9 of these were traced and 8, or 88.9 per cent, had lived five or more years. One of the 9 traced patients died of enteritis twenty-one months after operation. One patient that was not traced for as long as five years after operation was known to be well forty-two months after operation.

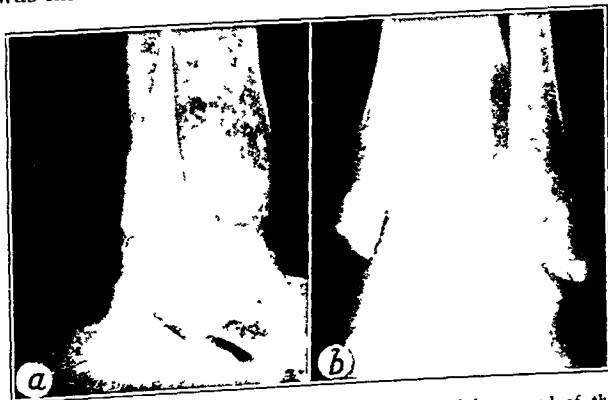


Fig 2—*a*, lateral view showing giant-cell tumor of lower end of the left tibia, *b*, anteroposterior view showing the tumor with involvement of the ankle joint

EXCISION, BONE GRAFTING AND IRRADIATION

In a group of 6 cases, or 5 per cent, irradiation was given after excision and bone grafting. In 5 of these operation was performed more than five years before

this study was made. Three patients were traced and all of them had lived five years. None of these had malignant lesions. Excision and bone grafting with or without irradiation result in the saving of extremities in cases which in former decades were considered hopeless, with amputation the only method of choice.

RESECTION

Resection of the entire portion of bone containing the tumor has a very limited field, but in certain cases in which there is involvement such as that found in the ribs, radius, ulna and fibula it is a method of choice. Certainly in those cases in which the tumor is located in the bone and the bone can be resected readily, such operation in the benign and low degree malignant type is ideal and should give the most satisfactory result. Simmons has reported good results in 100 per cent of

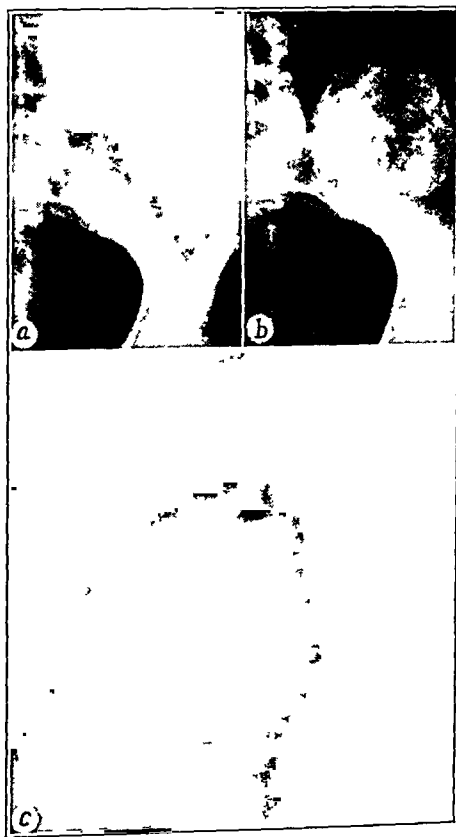


Fig 3—*a*, anteroposterior view showing giant cell tumor of the left ileum, *b*, anteroposterior view three years after biopsy and irradiation, which shows calcification of the tumor, *c*, same as *b* (lateral view).

his cases from the Registry of Bone Sarcoma. In our series 3 patients were operated on and traced and were living five years later (100 per cent).

AMPUTATION

Amputation was performed in 27, or 21.8 per cent, of our cases. In 24 of these amputation had been performed five or more years before the date of this study. All 13 patients who had had amputation for benign giant-cell tumor were traced for five years after operation and were well; 11 patients who had had amputation for malignant giant-cell sarcoma were traced for five years after operation; 8 of these survived for five years. Of the entire group of 24 patients on whom amputation had been performed five or more years before the date of this study, 21, or 87.5 per cent, survived for five or more years. In 20 of the

total 27 cases the amputation was a primary procedure, in 5 it followed excision and in 2 it followed bone grafting. Some of the patients had had previous treatment and were operated on a number of years ago, and infection, actinodermatitis, ulceration, fracture or recurrence may have been a complicating factor with or without malignant lesions. Amputation at that time was deemed advisable. Irradiation was not used prior to 1920 in our series, and of the 32 patients seen in the ten year period from 1916 to 1925 inclusive only 3 received irradiation, while during that same time amputation was performed in 13 cases. During the next fifteen years, from 1926 to 1940 inclusive, of the 92 patients seen only 14 had amputation while 20 had irradiation. Among older patients who have extensive destruction of bone in the region of a weight bearing joint, amputation may be preferred, whereas among younger patients an operation and attempt to save the extremity would

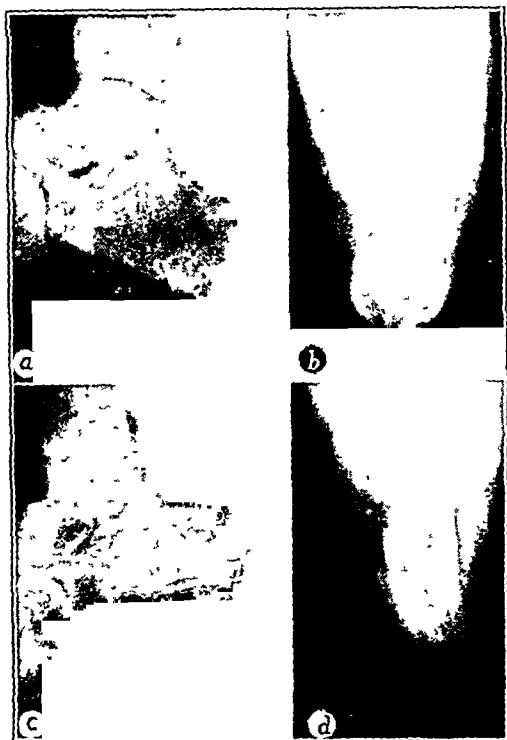


Fig. 4.—a, lateral view of the right foot showing giant cell tumor with extensive involvement of the os calcis, b, posterior view of the os calcis; c, postoperative lateral view showing multiple bone grafts in position after excision of the tumor, d, posterior view of os calcis showing bone grafts in position

be considered. In some instances in which we have amputated a painful and disabling extremity, the patient has been able to return to a gainful occupation with a complete change of his mental and physical condition.

Thirteen patients, or 65 per cent, of 20 patients who had malignant lesions, all of whom were operated on five or more years before the date of this study and traced, lived five years. Sixty-one, or 97 per cent, of 63 patients who had benign lesions and who were traced five or more years after treatment survived five or more years (table 6).

REPORT OF CASES

CASE 1.—A married woman aged 22, admitted to the clinic on May 10, 1937, complained of pain, local heat and swelling of the left wrist. She gave a history of having had a curettage of a tumor of the lower end of the left radius followed by eight roentgen treatments about nine months prior to her

admission. She denied trauma and stated that her symptoms had begun about one year previously.

A diagnosis of benign giant-cell tumor of the left radius was made, and after five courses of low voltage roentgen treatment the tumor was destroyed. In May 1941 the patient reported that, although some deformity was present, she had

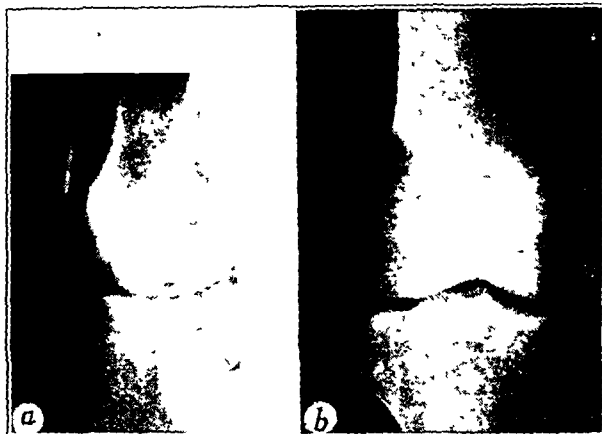


Fig. 5.—a, lateral view showing malignant giant cell sarcoma of lower end of right femur, b, anteroposterior view showing destruction of lateral condyle of right femur.

had no recurrence of the tumor and had had no further treatment. Roentgenograms now showed that the tumor was completely calcified (fig. 1).

CASE 2.—A man aged 37, admitted to the clinic on June 26, 1939, stated that he had received an injury to the left ankle three and a half months prior to his admission, and two weeks

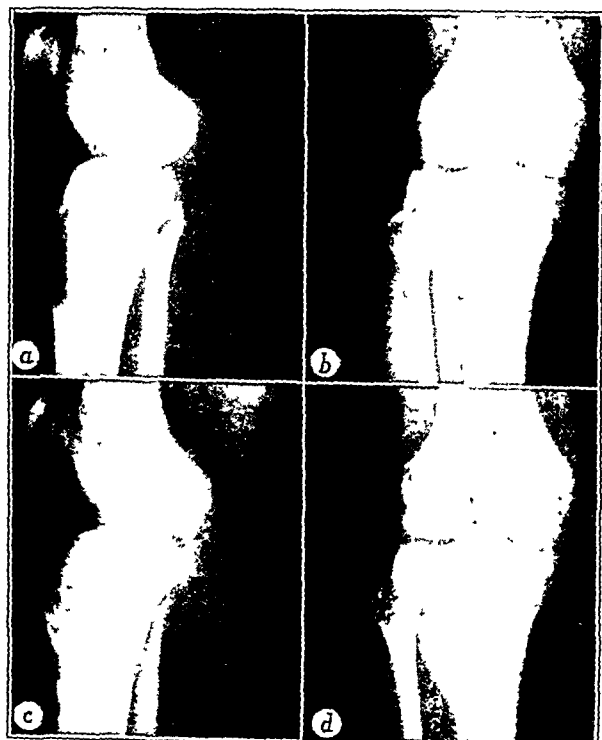


Fig. 6.—a, lateral view showing giant cell tumor of the upper end of right tibia; b, anteroposterior view; c, postoperative lateral view after excision of tumor and insertion of multiple bone chips; d, postoperative anteroposterior view.

subsequently pain and swelling had developed which had persisted. Furthermore he stated that he had consulted physicians, who had advised him to have his leg amputated for a malignant lesion

At the time of our examination there was pain and swelling of the left ankle and we suspected a malignant lesion but

advised operation under tourniquet and microscopic diagnosis. On June 27, 1939 the tumor was excised and bone grafts were inserted to fill in the defect. The pathologist reported a benign foreign body giant-cell tumor. Two low voltage roentgen treatments were given. Two years later, at the time of writing of this paper, the patient reported that he was well and had had no signs of recurrence of the tumor (fig. 2).

CASE 3.—A married woman aged 26, admitted to the clinic on June 8, 1937, complained of pain and swelling in the left buttock of four months' duration.

We suspected a malignant lesion of the left ilium, and an exploratory operation was advised. On June 16, 1937 the tumor was explored and on examination of the tissue the pathologist found that it was a benign foreign body giant-cell tumor. The patient was given nine low voltage roentgen treatments postoperatively and the tumor calcified.

In January 1941 the patient was delivered of a normal baby. At the time of writing of this paper, four years after institution of treatment, the tumor was completely calcified and the patient was in good health (fig. 3).

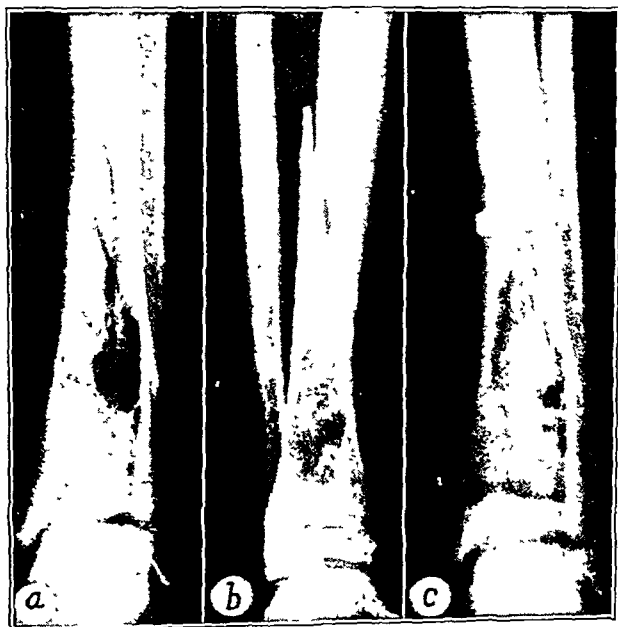


Fig. 7.—a, anteroposterior view showing giant-cell tumor with pathologic fracture of lower part of left tibia; b, lateral view; c, postoperative view showing fracture reduced and held by Parham bands, tumor excised and bone chips in position.

CASE 4.—A married woman aged 42, admitted to the clinic on Oct. 17, 1939, complained of pain in the right heel; there was no history of trauma.

A preoperative diagnosis of cyst or giant-cell tumor of the right os calcis was made. Operation was carried out on Nov. 1, 1939. A cystic cavity containing fluid and granulation-like tissue was removed; the pathologist reported a benign foreign body giant-cell tumor. The wound was swabbed with iodine, and multiple bone chips from the right tibia were inserted. The convalescence was uneventful and the patient reported seventeen months later that she was well and working and had had no further symptoms (fig. 4).

CASE 5.—A nun aged 40 years reported at the clinic for examination on Dec. 17, 1937, at which time she complained of pain and swelling in the lower part of the right femur of three months' duration.

A preoperative diagnosis of sarcoma of the right femur was made. Operation was performed on Dec. 20, 1937 under tourniquet, and an immediate microscopic diagnosis of malignant giant-cell sarcoma was made. The right leg was amputated immediately through the middle third of the thigh. The patient was given four low voltage roentgen treatments postoperatively. The convalescence was uneventful and, at the time of writing of this paper, the patient had had no recurrence and was well (fig. 5).

CASE 6.—A married woman aged 27, seen at the clinic on Dec. 19, 1939, complained of pain and swelling in the distal end of the right thigh of three months' duration.

A preoperative diagnosis of giant-cell tumor of the upper third of the right tibia was made. On Jan. 30, 1940 the tumor was excised and bone grafts were inserted. The pathologist reported a foreign body giant-cell tumor. The convalescence was uneventful, and one year after operation the patient was walking and apparently well (fig. 6).

CASE 7.—A boy aged 13 years, admitted to the clinic on Nov. 8, 1940, complained of pain, swelling and local heat in the lower part of the left tibia of two weeks' duration and stated that he had sustained a single severe injury at the site. A diagnosis of fracture of the lower part of the left tibia with questionable sarcoma had been made elsewhere.

A clinical diagnosis of giant-cell tumor or cyst with pathologic fracture was made. Operation was performed on Nov. 11, 1940, at which time the cavity was thoroughly excised. It was filled with yellowish granulation-like tissue, which was reported by the pathologist as a benign foreign body giant-cell tumor. The fracture was reduced and Parham bands were applied, after which multiple bone chips from the upper portion of the same tibia were packed about the region, completely filling the cavity. The convalescence was uneventful and the patient returned for observation two and a half months later, at which time the Parham bands were removed. The result was excellent (fig. 7).

SUMMARY

Giant-cell tumors may be divided into two groups, the benign giant-cell tumor and the malignant giant-cell sarcoma. These two terms clarify the question of the true nature of the lesion.

Accurate diagnosis and differentiation of benignancy and malignancy require microscopic examination and interpretation of the findings by a competent pathologist.

In tumors that apparently are benign, malignant changes may develop in time after surgical procedures or irradiation, or after a long period.

Treatment of the lesion varies in the individual case, but surgical removal when possible offers a rapid cure and permits an accurate microscopic diagnosis to be made in the majority of cases.

Irradiation has become of increasing value and may be used alone in some cases or as a postoperative adjunct.

The five year survival rate of patients with benign giant-cell tumor who are seen and treated early is 97 per cent, whereas for patients with malignant giant-cell sarcoma it is 65 per cent. The survival rate will be higher when all patients are seen early and the treatment is carried out by those who have had extensive experience with the condition.

The roentgenographic examination gives valuable information as to the location, size and character of the lesion, and the presence of pulmonary metastasis.

ABSTRACT OF DISCUSSION

DR. THEODORE A. WILLIS, Cleveland: My interest in the giant-cell tumor was aroused twenty-two years ago when as a house officer I had the privilege of working in the services of the late Drs. William B. Coley and George Barry. Dr. Coley called these things giant-cell sarcoma and treated them with his bacterial toxins. He reported a number of cures. Dr. Barry, in the other service, was convinced that they were benign. He called them hemorrhagic osteomyelitis and treated them by curettage, by swabbing with phenol and alcohol and by closure. Watching these two men and hearing their arguments back and forth, I became convinced that there were different types of this lesion: that they weren't all malignant and weren't all benign. Soon I had my first personal experience with one. The patient was a young man who had the lesion in the upper end of the radius. I curetted it, swabbed it with

phenol and alcohol and sewed it up. Pathologists at the University Hospital in Cleveland and at the Walter Reed Hospital reported the material a benign giant-cell tumor. Months later the patient came back with a recurrence. I excised the entire upper end of the radius, and he was given radium therapy by a competent radiologist. The pathologic report from that specimen was "osteofibroma; no signs of malignancy." A year later the patient came back again with a recurrence. We amputated his arm. The material went to the same two pathologists and both reported malignant sarcoma and both said that it was the type which did not tend to metastasize. That patient lived several years to my knowledge. He has left the city and I do not know whether or not he is alive, but that same lesion went through these three forms, so reported by competent pathologists. I have been confused at times by the way these things react. The epiphyseal type has reacted nicely to roentgen treatment in a number of cases. I am convinced, as Dr. Meyerding pointed out, that there are two types of these so-called giant-cell lesions, one of which is perfectly benign and responds well to thorough curettage and swabbing, and the other, which does not respond to that sort of treatment and does not even respond in my experience to roentgen or to radium therapy.

THE PROGNOSIS OF ACUTE HEMORRHAGIC NEPHRITIS IN CHILDHOOD

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Various divergent opinions of the prognosis of acute hemorrhagic nephritis in children have been explained on geographic regional variations, variations in the general health of the individual at and after the acute attack, different interpretations of observations, and many other bases. Until the obvious procedure of establishing minimum criteria for a healed kidney is utilized and is used uniformly in all studies, this controversy will continue.

Great variations in the evaluation of the prognosis of nephritis do occur when different investigators apply different standards of normalcy. The criteria used in previous studies fall generally into three groups (*a*) those which employ physical examinations, blood pressures and routine urinalysis¹ (table 1), (*b*) those which include one or more renal function tests² (table 2), and (*c*) those which include the quantitative examination of concentrated urine (Addis count³) with renal

function tests done as a routine or whenever indicated* (table 3). Snoke⁵ was the only worker to use the Addis count repeatedly over an extended period of time (table 4) in addition to the aforementioned procedures.

From 1928 to 1939 there were 110 patients with acute hemorrhagic nephritis in the Post-Graduate Hospital. Four patients (3.6 per cent) died during the initial manifestation of their disease. An attempt was made to contact the remaining patients and have them return for a follow-up study. Thirty-two did return, and these comprise the material for this study. They were subjected to the following procedures: physical examination, blood pressure determination, complete blood count, routine urinalysis and an Addis count, chemical blood examination for urea, nonprotein nitrogen, creatinine, cholesterol, serum albumin and serum globulin, and a urea clearance test.

The group included 19 boys and 13 girls whose ages varied between 3½ and 15½ years. The period of time that had elapsed since the acute manifestation ranged from one to ten and one-half years, with an average of five and four-tenths years. Only 4 patients in the study had had the acute illness less than two years before being examined. This is of considerable importance, since a study of this type should not include any patient having had the acute attack less than one year previously, and it is well known that there may be residual renal changes which will clear entirely before the first year has elapsed.

PHYSICAL EXAMINATION

The physical abnormalities of our patients consisted of dental caries in 2 and soft systolic murmurs at the apex which were considered functional in 5. In the latter group the pulse rate was normal and no cardiac enlargement was present. Since none of these patients had cardiac complications during the acute attack, we feel that this finding has no significance in this study. Even patients who do show clinical evidence of cardiac involvement and failure during the acute attack, though adding immediate danger to life, have a good ultimate prognosis. In a study of 12 such patients, Rubin and Rapoport⁶ reported that only 1 showed residual cardiac damage.

BLOOD PRESSURE

Three patients aged 4, 5½ and 8 years respectively showed slight elevation in the systolic pressure. When these readings were rechecked eight months later, the 8 year old child had a blood pressure reading 118 systolic and 70 diastolic. The pressures of the other 2 were normal. Because the blood chemistry, urea clearance and Addis counts were all normal, this hypertension probably has no significance. Hypertension usually closely parallels increases in blood urea and nonprotein nitrogen and is of value mainly in the late latent and terminal stages. We, however, intend to keep the child with the hypertension under observation.

BLOOD COUNTS

Only 1 patient showed any evidence of anemia. This was a 3½ year old child with 3,740,000 red blood cells and a hemoglobin reading of 9.8 Gm. There was no

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Read before the Section on Pediatrics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1 Schwarz, H., Kohn, J. L., and Weiner, S. B. The Prognosis of Nephritis and Nephrosis in Childhood, *New York State J. of Med.* 40: 409 (March 15) 1940. Osman, A. Etiology and Prognosis of Nephritis in Children and Young Adults, *Guy's Hosp. Rep.* 75: 306 (July) 1925. Boyd, G. L. Acute Nephritis in Children, *Canad. M. A. J.* 17: 894 (Aug.) 1927. Wyllie, W. G., and Paterson, D. Nephritis in Children: Its Prognosis, *Arch. Dis. Child.* 1: 103 (April) 1926. Lytle, J. D., and Rosenberg, Lester. The Prognosis of Acute Nephritis in Childhood, *Am. J. Dis. Child.* 38: 1052 (Dec.) 1929.

2 James, R. F. Prognosis of Nephritis in Children, *J. A. M. A.* 76: 505 (Feb. 19) 1921. Guild, H. G. Prognosis of Acute Glomerular Nephritis in Childhood, *Bull. Johns Hopkins Hosp.* 48: 193 (April) 1931. Tallerman, K. H. and Burkinshaw, J. H. Prognosis in Acute Nephritis in Childhood, *Lancet* 1: 1255 (June 3) 1939. Smellie, J. M., in discussion on Parsons, L. G. Acute Nephritis in Childhood, *Brit. M. J.* 2: 37 (Aug. 28) 1926.

3 No fluid is given to the child after 4 p. m., and all the urine voided between 8 p. m. and 8 a. m. is collected. Fifteen cc. of this specimen is centrifuged at high speed for ten minutes, 14.5 cc. of the supernatant fluid is pipetted off and 1 drop of the remaining 0.5 cc. placed in a blood counting chamber, and the number of casts, red blood cells and white blood cells in one or more large squares counted. Calculation
number of squares counted X volume of 12 hour specimen X 1,000
volume of area counted X 30
equals the number of casts, red blood cells and white blood cells per cubic centimeter

4 Cass, Jean M.: The Ultimate Prognosis of Nephritis in Childhood, *Arch. Dis. Child.* 11: 137 (June) 1939. Boyle, H. H.; Aldrich, C. A., Frank, Albert, and Borow, J., Sydney. The Addis Count in Children, *J. A. M. A.* 108: 1496 (May 1) 1937.

5 Snoke, A. W. Stages, Prognosis, and Duration of Glomerular Nephritis in Childhood, *Am. J. Dis. Child.* 53: 1 (March) 1937.

6 Rubin, M. I., and Rapoport, Milton. Cardiac Complications of Acute Hemorrhagic Nephritis, *Am. J. Dis. Child.* 55: 244 (Feb.) 1938.

other abnormal finding, and it probably bears no relation to the original nephritis. Presumptive evidence of this lies in the fact that Brown and Roth⁷ and Ashe⁸ have shown that the anemia in nephritis is directly proportional in intensity to the degree of impairment of renal function, of which this child had none.

TABLE 1.—Criteria Employing Physical Examinations, Blood Pressures and Routine Urinalysis

	Number of Cases	Time Observed	Healed	Abnormalities	Comment
Schwarz et al . . .	120	1 to 16 years	101 (84 1%)	14 (11.7%)	5 had albuminuria only (4.2%)
Osman	56	1½ to 22 years	36 (64%)	20 (36%)	5 had elevated blood pressures only
Boyd	44	2 to 5 years	36 (82.8%)	8 (17.2%)	Albuminuria with or without casts
Paterson	26	3½ to 5½ years	12 (47.5%)	14 (52.5%)	9 of these had urinary abnormalities only
Lyttle	38	1 to 7 years	34 (89.4%)	4 (10.6%)	

URINALYSIS

The urine of 2 patients showed faint traces of albumin, of 2 showed traces and of 2 showed 1 plus albumin. Of the 2 who showed faint traces, 1 had a high white blood cell count in the Addis count with no other abnormality, and the other showed the same conditions plus a chronic genitourinary infection, with an intravenous urogram showing bifurcation of the renal pelvis on the left side. We believe that the albuminuria in both of these cases was due to the pyuria and not to nephritis.

TABLE 2.—Criteria Including One or More Renal Function Tests

	No of Cases	Time Observed	Healed	Abnormalities	Function Test Used	Comment
James	67	3 mo to 16 yrs.	58 (86%)	9 (14%)	Specific gravity concentration test	Considered only albuminuria significant
Guild	34	1 to 12 yrs	9 cases of albuminuria only—failed to classify		Phenolsulfonphthalein 2 hr renal function test; nonprotein nitrogen	
Tallerman	16	8 yrs	15 (93.4%)	1 (6.6%)	Blood urea phenolsulfonphthalein; urea concentration	Includes in recovery albuminuria but no casts or abnormal cells
Smellie	16	Average 16 yrs.	5 (33%)	11 (66%)		Had either high blood urea and low urea concentration test or enlarged heart and raised blood pressure; urines all normal

The 2 patients showing traces of albumin were reexamined this month and urinalyses, including Addis counts, gave negative results. One patient having 1 plus albumin showed no other abnormality, and we were unable to get this child to return for reexamination.

7. Brown, G. E., and Roth, Grace M.: The Anaemia of Chronic Nephritis, *Arch. Int. Med.* 30: 817 (Dec.) 1922.

8. Ashe, Benjamin: The Hemoglobin Percentage and the Red Blood Cell Count in Bright's Disease, Myocardial Insufficiency and Hypertension, *Arch. Int. Med.* 44: 506 (Oct.) 1929

He will have to be followed further before his condition can be classified and until then must be considered as having potential latent nephritis. The other child having 1 plus albumin was recently reexamined and found to have only a faint trace. With all other conditions normal and with the Addis count, including a quantitative estimation of the protein content (0.18 Gm.) within normal limits, we do not believe that this child should be classified as having persistent nephritis.

Persistent albuminuria unaccompanied by any other abnormal finding is, in a study of this type, hard to interpret. The interpretations vary from Guild's² liberal feeling that albumin may stay in the urine for years with no damage to the kidney, to the more conservative attitude of Snook⁵ and Schwarz and his associates¹ that children must be further observed and have normal urine before being given a clean bill of health. We agree with the latter opinion. Depending on the interpretation of this finding, evaluation of the prognosis of any series of nephritic patients may be good or extremely bad.

RENAL FUNCTION TESTS

Mosenthal⁹ has wisely observed that no one particular test really deserves preference, but a full realization of the significance of these tests will come only to the

TABLE 3.—Criteria Including Addis Count

	No of Cases	Time Observed	Healed	Abnormalities	Comment
Cass	85	6 mo to 5 yrs	56 (66%)	29 (33%)	2 patients in terminal stage of disease
Boyle et al	25	6 mo. to 8 yrs	25 (100%)	..	Patients selected from a series of 250 clinically healed postinfectious nephritides; 1 had a high Addis count, with chronic infection of the urinary tract

physician who has carried out and read many observations and has become familiar with them and their many variations. Other investigators have used singly or in combination the phenolsulfonphthalein test, the two hour concentration test, various clearance tests and blood chemistry studies. We used the urea clearance test, since we agree with Mosenthal¹⁰ and Lyttle¹¹ that it is probably the most accurate way of determining the functioning kidney tissue, and we rechecked these observations with blood chemistry studies to see how efficiently the available kidney parenchyma was eliminating the renal excretory products.

Van Slyke¹² has shown that the concentration test is more sensitive than the clearance test to slight degrees of renal damage; hence if the concentration test yields a normal result, it is not necessary to measure the clearance. On the other hand, he has shown that the concentration test fails to show the differences between moderate and severe renal damage. If the concentration test yields a urine of low specific gravity, it is necessary to determine also the urea clearance in order to ascertain whether the decrease in excreting power is serious.

9. Mosenthal, H. O.: The Diagnosis and Treatment of Variations in Blood Pressure and Nephritis, in Christian, H. A.: *Oxford Monographs on Diagnosis and Treatment*, New York, Oxford University Press, 1929, vol. 7, p. 298.

10. Mosenthal, H. O.: p. 300.
11. Lyttle, V. D., in Holt, L. E., Jr., and McIntosh, Rustin: *Heli's Diseases of Infancy and Childhood*, ed. 11, D. Appleton Century Company, Inc., 1939, p. 790.
12. Van Slyke, D. D.: *Renal Function Tests*, New York State J. Med. 41: 825 (April 15) 1941.

The urea clearance test is especially important since it is recognized¹³ that the usual tests for renal function indicate impairment only when from 50 to 60 per cent of the kidney tissue is not functioning.

In all 32 cases we found normal urea clearance and no abnormalities in the chemistry of the blood. This is of special significance, since it is associated with the following Addis counts.

TABLE 4.—*Snoke's Results*

Snoke	From 1920 to 1936—154 patients followed—29 of them for less than two years.
	57 (37%) cured; 33 (21%) died and 64 (42%) still had active nephritis (California).
	Working in Rochester, N. Y., finds only approximately 10 per cent with persistence of urinary changes.

ADDIS COUNT

Snoke⁵ has shown that during the latent period of nephritis the child may be in apparent good health and the ordinary renal function tests may indicate normal renal function. He has further shown that in these children a latent nephritis may exist and be revealed only by the quantitative study of concentrated urine (Addis count).

Cass,⁴ in her study using the Addis count, showed that 16 patients were actually in the latent stage but clinically were normal and had normal urine on routine examination. Eleven of these even gave normal Addis readings one or more times, and she agrees with Snoke that these counts should be done repeatedly. Boyle and his associates⁴ selected 25 patients from 250 clinically healed patients with postinfectious (hemorrhagic) nephritis, and did one Addis count on each. All were normal except one who had a chronic infection of the renal tract.

The contradictory results in these various studies (tables 3 and 4) in which the Addis count was used are probably due partially to the fact that the counts were not repeated over a given period of observation as was done by Snoke. Originally we did one Addis count on each of our 32 patients. As a criterion of normalcy we used the ranges established by Lyttle¹⁴ and Snoke¹⁵ (table 5).

TABLE 5.—*Ranges of Addis Counts of Lyttle and Snoke*

		Average	Min- imum	Maxi- mum	Suggested Super- normal
Casts.	Lyttle	1,085	0	12,916	10,000
	Snoke	1,230	0	29,000	10,000
White epithelial cells.	Lyttle	322,184	9,000	2,822,000	2,000,000
	Snoke	.....	.....	.....	.....
Red blood cells.	Lyttle	15,181	0	129,000	600,000
	Snoke	81,600	0	800,000	600,000
Protein (albumin), mg.	Lyttle	18.5	3	47	35
	Snoke	28.5	5	90	55

All of our patients had a normal reading except 2 who had high white blood cell counts. Twenty patients had no red blood cells; the other 12 had red cells ranging from 14,333 to 172,000. None had any casts. The two high white counts were 19 and 20 million respectively, and both patients had a faint trace of albumin with no other abnormality in the routine urinalysis. One patient,

as we stated before in discussing urinalysis, had a chronic infection of the urinary tract with a bifurcation of the left renal pelvis. This can account for the high white cell count. The other patient had an accompanying albuminuria, with all other examinations negative, and we feel that this patient has pyuria rather than nephritis. Three of the original 6 patients with albuminuria were reexamined with a second Addis count, all of which were within normal limits.

The use of the Addis technic is impracticable in routine urinalysis but should be employed when the slightest urinary abnormality exists and should be repeatedly done whenever this abnormality persists. It should be a prerequisite before the discharge of a nephritic patient when all other conditions are normal.

SUMMARY

Thirty-two children who had acute hemorrhagic nephritis were studied from one to twelve years after the acute attack. All were essentially normal physically except 1 who had an elevated blood pressure. Routine urinalyses showed originally 6 with albuminuria. Two of these had high white blood cell counts in the Addis readings, which were ascribed to pyuria rather than to nephritis. Two were reexamined eight and ten months later and found to be normal. One patient showed no other abnormality and had two normal Addis counts eight months apart. We think that this patient should not be classified as one having latent nephritis. One patient having no other abnormality refused to return for further study and necessarily must be classed as having potential latent nephritis.

Chemical examinations of the blood for retention of nitrogenous products were all negative. Urea clearance tests on all patients were negative and there was no anemia ascribable to the nephritis.

Addis counts done on all the children were normal, with the exception that 2 had high white blood cell counts that we felt were due to pyuria rather than to nephritis.

No patients were in the terminal stage.

From the evidence in this study and from a review of the literature on this subject it is evident that minimum criteria should be established for a normal kidney before a patient is discharged as cured after an acute attack of hemorrhagic nephritis, and we suggest the following: routine physical examination, blood pressure and urinalysis every three months up to and including two years after the acute attack, and an Addis count done at this time. If during the course of these two years there is the slightest urinary abnormality, the case should be followed at intervals with Addis counts and urinary function tests as indicated. All scientific studies should include the Addis count in following the course of the disease.

Although the evidence we have correlated from this study gives an excellent prognosis to acute hemorrhagic nephritis in this group of children who survived the initial attack, we feel that the outcome of any one case or group of cases is unpredictable.

CONCLUSIONS

1. Of 32 cases of acute hemorrhagic nephritis followed and studied for from one to twelve years after the acute attack, only 1 is possibly in the latent stage of nephritis and none is in the terminal stage.

2. The investigatory work on the prognosis of nephritis should be standardized on the suggested minimum criteria for a healed kidney so that results in various studies may be compared intelligently.

13 MacKay, E. M., and MacKay, L. L.: The Relation Between the Blood Urea Concentration and the Amount of Urine Excreted. *J. Clin. Investigation* 4: 127 (April) 1927.
and Van Slyke, D. D.: Studies of Urea Between Urine Volume and Rate of Urea Excretion. *Bright's Disease, J. Clin. Investigation* 6: 463 (Dec.) 1928.
14 Lyttle, J. D.: The Addis Sediment Count in Normal Children. *J. Clin. Investigation* 12: 87 (Jan.) 1933.
15 Snoke, A. W.: The Normal Addis Sediment Count in Children. *J. Pediat.* 12: 473 (April) 1938.

ABSTRACT OF DISCUSSION

DR. JEROME L. KOHN, New York: Drs. Schwarz, Weiner and I have followed at the Mount Sinai Hospital about 230 patients discharged from the pediatric service with a diagnosis of acute hemorrhagic nephritis. These patients were followed from one to twenty years after the onset, the average period of study being four to five years. Of all our patients with acute nephritis 5 per cent died, usually in the first week of illness. Of the patients followed, about 85 per cent seemed to have recovered completely. Of the remaining 15 per cent, slowly progressive chronic nephritis had developed in 5 per cent. Another 5 per cent had what we call nonprogressive nephritis; that is, there was constantly some albuminuria, perhaps slight hypertension but no clinical symptoms. This group has been followed from one to seven years. The remaining 5 per cent we have as yet not classified. Except for occasional albuminuria, they are clinically normal. We have noted what we call the "illness test." By this we mean how well does the kidney withstand infection after an apparent recovery from acute nephritis? During such an illness some children have slight albuminuria and a few red blood cells in the urine. We consider their nephritis as probably not completely healed. If a patient does not have albuminuria, hypertension or an increase in blood urea for one year after the onset there is probably a complete cure. We believe that intensive urinary functional tests are not necessary to give a satisfactory prognosis except in the occasional case in which the prognosis is difficult or when the patient cannot be adequately observed clinically for a long enough period. There are few records of postmortem examination of persons who have had acute hemorrhagic nephritis and died of another illness several years later.

EMBRYOMA OF THE KIDNEY
(WILMS' TUMOR)

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Embryoma of the kidney has been classified under various titles according to the predominant cell found at microscopic examination. For this reason it is important to define clearly what is meant by this term. We consider embryoma of the kidney as a highly malignant tumor peculiar to infancy and early childhood. It originates in the kidney and is of probable congenital origin. The tumor grows rapidly at times and assumes enormous proportions. Metastasis takes place by direct extension through its capsule, by the regional lymphatics or by the blood stream to the lung or brain. On gross appearance the tumor is a large encapsulated, grayish white mass encroaching on some portion of the kidney and destroying a greater or lesser part of it by pressure. The remaining portion of the kidney is divided from the tumor by a connective tissue capsule, but it cannot be dissected free from it. Occasionally, malignant nodules are found in this separated portion of the kidney. On microscopic examination one finds the tumor made up of undifferentiated or partially differentiated cells of the epithelial or connective tissue group. One may find in the same tumor epithelial cells, smooth and striated

muscle cells and even bone or cartilage. There may be a great variation not only in the cells but also in the degree of activity in various portions of the same tumor. Hemorrhage and necrosis within the tumor sometimes leading to rupture of the capsule are not uncommon, and invasion of the renal vein or renal pelvis also occurs. As the predominance of one type of cell over another has no bearing on the progress of the tumor or the prognosis for the child, the subdivision of these tumors according to the predominant type of cell can serve no useful purpose clinically.

The renal embryoma should be differentiated from the sympathetic neuroblastoma arising either in the medulla of the adrenal or in the retroperitoneal space adjacent to it or rarely in the kidney itself. The neuroblastoma has a different gross and microscopic appearance and the metastasis commonly takes place earlier and to bone rather than to the lung. The hypernephroma or Grawitz tumor occurs so rarely in early childhood that it should not be a source of confusion. We have not seen a tumor of this type in a child under 12 years of age. The one other tumor which might cause difficulty in differentiation is the embryoma of renal anlage which resembles closely the embryoma of the kidney, both grossly and microscopically, but it is not attached to the kidney.

DIAGNOSIS

In the diagnosis of embryoma of the kidney the age incidence is of some significance, as this tumor is primarily a disease of the first three years of life. Our youngest patient was 2 months old and the oldest was 9 years, the average being between the second and third years. The distribution between the two sexes and between the two sides is so nearly equal that it is unimportant. The correct diagnosis is arrived at largely from the clinical history and from palpation of the abdomen, and to a lesser degree by supporting evidence of roentgen examination.

The commonest complaint of the parent or child is swelling of the abdomen and not infrequently the feeling of the mass. Occasionally the child shows loss of weight but more commonly the child remains in an excellent state of nutrition, even in the presence of an enormous tumor. From pressure on adjacent organs these children sometimes have vomiting, abdominal pain, anorexia, irritability or listlessness, but such symptoms are more commonly absent.

On physical examination the tumor can usually be moderately accurately outlined as it is not tender and there is no muscle spasm over it. It feels solid, is not mobile and usually has a smooth and rounded outline extending often to the midline and from the costal border well down into the ileac fossa. Although gross or microscopic hematuria is not an uncommon finding, it is not frequent enough to be in any sense pathognomonic and, in fact, normal urinary conditions are more usual.

Pyelography may and, as a rule, should be used as an aid to diagnosis, but there is no distortion of the renal pelvis sufficiently characteristic to be positively indicative of embryoma. In an embryoma of the kidney the renal pelvis is commonly displaced upward or downward according to the position of the tumor, and it is sometimes pushed toward the midline. In a retroperitoneal neuroblastoma the pelvis may be displaced laterally, but there is not enough uniformity in either of these conditions to be able to differentiate the two by the pyelogram alone. Of course if one cannot differ-

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In the preparation of this paper one hundred and sixteen articles on Wilms' tumor were reviewed. Only those articles quoted in the text are mentioned.

Read before the Section on Surgery, General and Abdominal, at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 3, 1941.

entiate between the new growth of the kidney and hydronephrosis or pyelonephrosis, the pyelogram will settle the question. The real merit in pyelography in a case of suspected embryoma, however, is to determine the presence and normality of the kidney of the opposite side. Since embryomas occur most commonly in the age group requiring a general anesthetic for retrograde pyelography, we are commonly satisfied with the data obtained by the intravenous method. By using this method and avoiding a general anesthetic, less delay is occasioned than by a cystoscopic examination. It is of paramount importance to make the diagnosis of embryoma as early in life as possible, as from our experience the younger the patient the better is the chance of cure. The number of cures that we can anticipate in the future is therefore dependent to some extent



Fig 1 (A. R.).—Section under low power magnification showing typical appearance of an embryoma of the kidney. The specimen was taken for biopsy from a mass involving the right kidney, Jan 27, 1938 of a patient with bilateral embryoma.

on the alertness of the pediatrician and of the family physician and their realization of the existence of this extremely malignant tumor of early life.

We abandoned the practice of aspiration biopsy many years ago. It is unreliable and may cause implantation recurrence or set cells loose into the blood stream to result in remote metastasis. The danger of malignant cells entering the blood stream is a real one, and every precaution should be taken to avoid its occurrence. On a theoretical basis rough or frequent palpation of the tumor is contraindicated.

Other intra-abdominal tumors that occur in this age group are ovarian tumors, splenomegaly, omental cysts, duplications of the alimentary tract and new growth of the liver, but they all have characteristics sufficiently definite to make their differentiation possible.

PREOPERATIVE IRRADIATION

There is no uniformity of opinion about the merits of preoperative irradiation, although its employment has been widely advocated. The advantages and disadvantages of this form of therapy should be carefully con-

sidered. Almost all surgeons and roentgenologists are agreed that this tumor is usually quite radiosensitive, that its size may be diminished by a comparatively short course of roentgen therapy and that the operative procedure may be somewhat facilitated thereby. Also, prac-

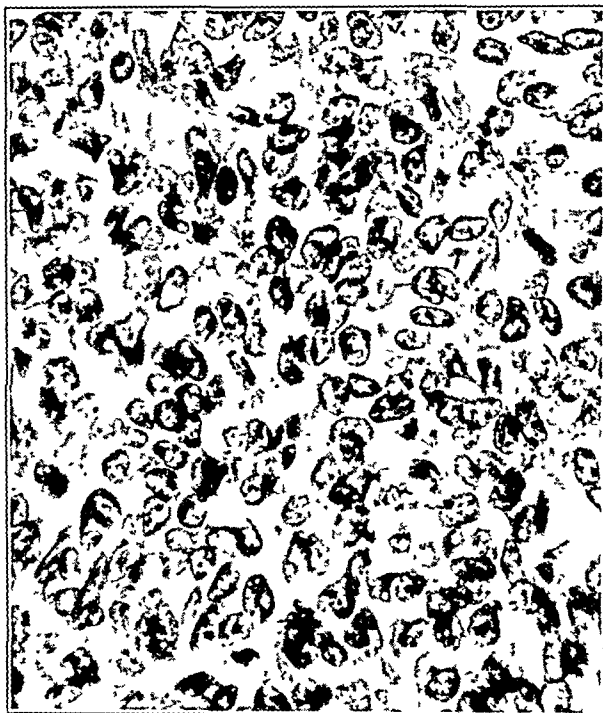


Fig 2 (A. R.).—Same specimen as shown in figure 1 under high power magnification.

tically all surgeons and pathologists are agreed that no case of proved embryoma has been cured by roentgen therapy. In every specimen that has been examined following roentgen therapy viable cells have been in evidence.

Does roentgen therapy hinder or prevent metastases? There is no evidence that it does. In fact, on a theo-

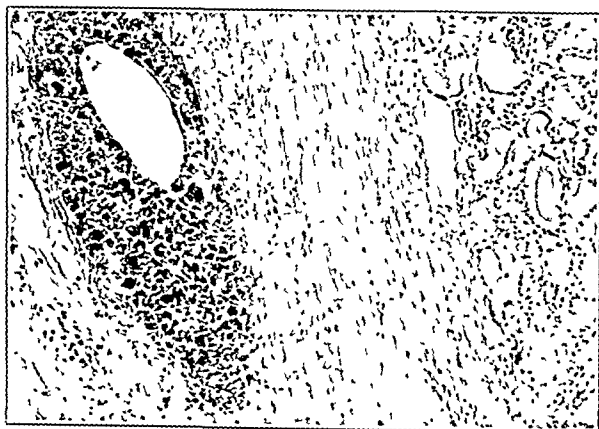


Fig. 3 (A. R.).—Specimen of same kidney and tumor outside kidney shown in figures 1 and 2 removed at autopsy Sept 5, 1938 after 9,600 roentgens had been given in radiation therapy. Viable tumor cells are still present.

retical basis it might facilitate rather than hinder metastasis. It is known that the effect of irradiation is first to soften the tumor and then to contract it by the replacement of some of the cellular elements with connective or scar tissue. During this period of change it

would seem at least logical to presume that malignant cells might enter the blood stream quite as easily, if not more easily, than if the changing process had not been caused by the roentgen treatment. Regardless of the accuracy or inaccuracy of this theoretical conjecture, we will defy anybody to prognosticate when metastasis is going to take place. In instances in which patients have died of remote metastasis and have shown no local metastasis at postmortem examination it is fair to assume that the metastasis had taken place prior to operation and that the child's life might have been saved had the operation been performed a month, a week or even a day earlier. In some instances we actually have found tumor cells floating in the blood stream of the renal vein at the time of operation. In instances in which the patients have been cured, presumably the operation was performed before metastasis had taken

high, in recent years this situation has been changed. In the days when we attempted these operations by the posterolumbar incision, when knowledge of fluid balance was limited and when the use of transfusion was only occasional, our operative mortality was very high. In the last eight years, however, with the adoption of the transperitoneal approach and with improved technic in preoperative and postoperative treatment, we have performed 23 nephrectomies for renal embryoma with no operative mortality. The last operative death occurred in 1932. We define operative mortality as any death which takes place while the patient is in the hospital.

OPERATIVE TECHNIC

Perhaps the most important feature of the operative technic is that it should be done as soon as a probable diagnosis can be made and the patient properly pre-

TABLE 1—Number of Probable Cures by Two Types of Treatment

Author	Year	Number of Cases	Nephrectomy With Preoperative Irradiation	Nephrectomy Without Preoperative Irradiation	Irradiation Not Stated
Schmid, H. Beitrage zur Chirurgie der Nieren, Munchen Med Wchnschr 15:244, 1892	1892	2	0	1	0
Israel, J. Erfahrungen uber Nierenchirurgie, Arch fur klin Chir 42:302, 1894	1894	3	0	2	0
Abbe, R. Sarcoma of the Kidney Its Operative Treatment, Ann Surg 19:58, 1894	1894	1	0	1	0
Muus, N. R. Uter Arch f path Anat 100:401, 1899	1899	6	0	1	0
Jenckel, A. Beitrag zur Kenntnis der sogenannten embryonalen Drusen geschwulste der Niere, Deutsche Ztschr f Chir 60:502, 1901	1901	1	0	1	0
Abbe, R. Long Lasting Cure after Removal of Sarcoma of Kidney in Infancy, Ann Surg 56:469, 1912	1912	1	0	1	0
Loughnane, F. M. Renal Sarcoma of Infancy with a Record of Thirty Five Cases, Brit J Surg 2:77, 1914	1914	35	0	0	4
Hyman, A. Tumors of the Kidney, Tr Am Urol A 12:242, 1920	1920	8	0	0	1
Magoun, J. A., and MacCarty, W. C. Malignant Neoplasia of the Kidney Occurring in Infancy, Surg, Gynec & Obst 36:781 (June) 1923	1923	7	0	0	1
Wollstein, M. Renal Neoplasms in Young Children, Arch Path 3:1 (Jan) 1927	1927	18	0	0	2
White, W. C. Wilms' Mixed Tumor of the Kidney, Ann Surg 94:159 (July) 1931	1931	9	0	2	0
Coley, W. B. Wilms' Tumor, Am J Surg 29:463 (Sept) 1933	1933	2	0	1	0
Prather, G. C., and Friedman, H. F. Immediate Effect of Preoperative Radiation in Cortical Tumors of Kidney, New England J Med 215:655 (Oct 8) 1936	1936	1	1	0	0
Campbell, C. O. Studv, Arch 100:100, 1936	1937	37	1	1	0
Stern, R. O. Kretechner's	1938	26	0	0	3
Long, L. W. Wilms' Tumors Embryonal Adeno-sarcomas of Kidney, South M J 32:1016 (Oct) 1939	1939	13	1	1	0
Priestley, J. I. Case, Arch 100:100, 1939	1939	37	1	3	0
Kaplan, I. I. Case, Arch 100:100, 1939	1939	1	1	0	0
Higgins and Shively's Children's Hospital series	1941	26	2	2	0
	1941	60	1	1	0
Total		318	9	31	12

place. If the foregoing statements are correct, one would expect to find that more patients with embryoma have been cured without the use of preoperative roentgen therapy than with it.

In a very extensive review of the literature we have found 563 cases reported with 26 cures in which it was specifically stated whether or not preoperative roentgen therapy had been used. Of these only 8 patients had received preoperative roentgen treatment. In our own series the contrast is even more striking—only 1 of 14 patients with probable cure had received preoperative irradiation. From a statistical point of view, then, it can be stated that the chance of survival for a patient with embryoma of the kidney is far greater if the policy of immediate operation is adopted rather than the policy of delayed operation following roentgen therapy.

The only argument left in favor of employing preoperative irradiation is that the operative mortality is high and that this complimentary therapy reduces it. While it is true that in some other clinics, as well as in our own, in the past the operative mortality was

pared. Since a general anesthetic is indicated, we elect the use of ether. The transperitoneal approach has many advantages over the retroperitoneal approach through a posterolumbar incision. Whether this transperitoneal approach is done through a vertical or a transverse incision is immaterial except that in the common large

TABLE 2—Mortality in Wilms' Tumor The Children's Hospital Series

	1914-1933	1933-1941	1941-1941
Total number of cases	13	17	20
Total mortality	97.0%	70.5%	60.0%
Operative mortality	23.0%	23.5%	10.0%

tumors—extending to or beyond the brim of the pelvis—the vertical incision is preferable. We usually use a vertical incision. After the anterior parietal peritoneum has been opened, the ascending or descending colon according to the side on which the tumor exists is packed toward the midline and an incision is next

made in the posterior peritoneum over the tumor or renal pedicle. The renal pedicle and ureter are next carefully exposed, tied and cut before any attempt is made to mobilize the tumor and attached kidney. We believe that doing this step in the operation first is



Fig. 4 (S S)—Section from a recurrent tumor which had been treated by roentgen rays, showing tumor cells embedded in a fibrous tissue background

of prime importance. It results in the loss of much less blood and minimizes the danger of pushing malignant cells into the blood stream in the process of handling the tumor. The tumor is next mobilized and removed with as much perirenal fat as possible, especially that about the renal pedicle, as this contains the lymphatics in which recurrence may take place. The large raw surface of the posterior abdominal wall is now covered over with peritoneum when feasible or disregarded if not feasible. The abdominal wound is next closed in layers without drainage. In the postoperative care morphine is given in adequate doses and parenteral fluids or transfusion given as indicated.

We abandoned the use of the posterolumbar incision many years ago for the following reasons: It is extremely difficult or even impossible to remove some of these tumors through such an incision. It is possible that some tumors are classed as inoperable because they are approached by this route. Since adopting the transperitoneal approach, we have not considered any case inoperable and have successfully operated in at least 1 case in which the weight of the tumor was one fourth that of the child. We think that more blood is apt to be lost when the tumor is approached by the posterolumbar route. When this incision is used, the kidney must be handled before the renal pedicle is tied and the possibility of spreading malignant cells into the blood stream must be increased. We believe that our lack of mortality in the last eight years is due largely to adopting the transperitoneal approach and to the increased facility which this approach gives in handling the renal pedicle and in removing the tumor.

POSTOPERATIVE IRRADIATION

The difficulty in evaluating the merits of postoperative irradiation is even more appreciable than that of evaluating the merits of preoperative irradiation. We have been unable to find in the literature a sufficient number of cases in which it was stated that postoperative irradiation had been used to make the numbers of any statistical significance. Our own experience with this form of therapy has also been too limited to be of much value. We can state, however, that roentgen therapy on a recurrence apparently has a similar reaction to that on the original tumor, namely that it shrinks the tumor but does not destroy all the cells. All specimens of a recurrent tumor that have been irradiated and later have been examined have shown viable cells. We have no patient who has had a recurrence and who has survived. From this experience it would seem logical to deduce that one cannot cure a recurrent embryoma by roentgen therapy any better than one can cure the original tumor. One must, therefore, consider postoperative irradiation only from the point of view of prophylaxis against recurrence.

If one is going to use this form of therapy for this purpose, the most suitable parts of the anatomy to irradiate would be the abdomen, the lungs and the brain. It is doubtful whether sufficient doses of roentgen rays could be given to these areas so as to destroy at once the malignant cells which might have lodged there without giving so much that it would destroy the child. For the present it must be stated that there are insufficient data available to evaluate the merits of postoperative roentgen therapy and that if it is used

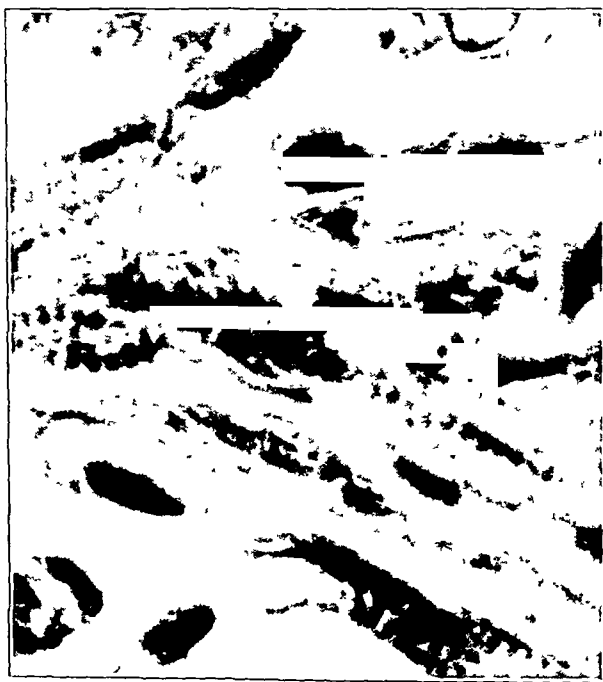


Fig. 5 (S. S.)—Same section shown in figure 4 under high power magnification. Note that viable and numerous striated muscle tumor cells are still present.

it is on the vague chance that it might destroy some cells which otherwise would grow to form a lethal recurrence. One might add that the use of postoperative roentgen therapy does not have the disadvantages of preoperative irradiation, namely delaying the operation beyond the time at which the cure may be obtained.

PROGNOSIS

The statement is commonly found in the literature that the mortality of embryoma of the kidney is between 90 and 100 per cent. From our extensive review of the literature, this estimate seems to be quite accurate as the mortality of the combined results of numerous clinics. Among the larger series that have been reported

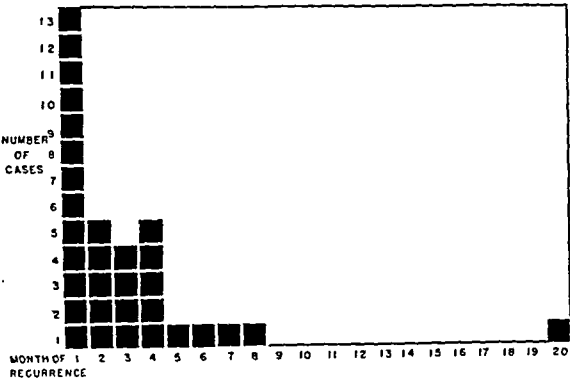


Fig. 6.—Time of recurrence of Wilms' tumor (postoperative) in the Children's Hospital series.

recently may be mentioned those of Priestley¹ in 1939 with 37 cases and 4 cures, Campbell² in 1937 with 37 cases and 2 cures, Higgins and Shively³ in 1941 with 26 cases and 4 cures and Kretschmer⁴ in 1938 with 24 cases and 3 cures.

Our own series comprises 60 patients, 18 of whom are still living; 14 of these have probably been cured while 4 have been operated on too recently to be so classified. Of these 4 patients, 3 are considered as having a very hopeful prognosis and 1 as having a hopeless outlook, since there is a bilateral tumor.

Are there any factors in the particular case which give a clue as to the probability of recovery or cure? It is frequently stated that the size of the tumor bears a direct relation to the mortality. Our experience does not coincide with this statement, as some of our patients with the largest tumors are among those cured, while some of the patients with the smaller tumors have had early metastasis and a fatal outcome.

We have been unable to correlate any relationship between the predominant type of cell and the chance of cure. In our series there appears to be a relationship between the age of the patient and the curability.

TABLE 3.—Embryoma of the Kidney (Wilms' Tumor): The Children's Hospital Series

Total number of cases.....	60
Number of deaths.....	42
Operative.....	8
Metastases.....	32
Unrelated.....	2
Number of probable cures.....	14
Number of hopeful cases.....	3
Number of hopeless cases.....	1

Of 16 cases occurring in the first year of life, 50 per cent resulted in cure. Gross hematuria which occurred in 10 of our patients was a bad sign, as all the patients with this condition died. Also, the patients in whom the tumor had invaded the renal vein had a fatal result.

In the vast majority of cases recurrence is detectable by the end of four months so that if no evidence of recurrence or metastasis is demonstrable at this length of time we become hopeful about the ultimate result. Twenty months is the longest time that a patient has gone without showing signs of recurrence and then had it develop, and this happened in 1 instance only. In our series there were 32 recurrences; 31 of these took place prior to the ninth month after operation. We have had no patient who has gone for two years without recurrence in whom it has later developed. In this particular form of malignant tumor, therefore, it is reasonable to consider a patient as probably being cured who has survived for two years after operation without evidence of recurrence.

Table 4 shows the number of patients probably cured and the duration of their cure out of a series of 60 patients treated at the Boston Children's Hospital. The first 11 of the 14 probable cures listed in table 4 were previously reported by one of us.⁵

TABLE 4.—The Late Results of Nephrectomy for Renal Embryoma

Cases	Sex	Age	Nephrectomy	Well After Operation For
A. Probable Cures				
1	♂	5 months	Left	20 years
2	♀	31 months	Right	15 years 7 months
3	♀	10 months	Left	12 years 10 months
4	♀	12 months	Right	10 years
5	♀	5 months	Left	9 years 10 months
6	♀	5½ years	Right	9 years 6 months
7	♀	22 months	Right	8 years 2 months
8	♀	7 months	Right	7 years
9	♀	10 months	Left	4 years 7 months
10	♀	8 months	Right	4 years 1 month
11	♀	5½ years	Left	3 years 3 months
12	♀	5 months	Left	2 years 5 months
13	♀	13 months	Right	2 years 2 months
14	♂	4 yr. 1 mo.	Right	2 years 1 month
B. Possible Cures				
1	♂	2 yr. 6 mo.	Left	9 months
2	♀	2 yr. 2 mo.	Right	7 months
3	♀	3 yr. 11 mo.	Left	3 months

CONCLUSION

The results of a review of the literature and our experience lead us to conclude that in the treatment of embryoma of the kidney:

1. The operative mortality should be negligible.
2. The transperitoneal approach is safer and is to be preferred to the posterolumbar retroperitoneal approach.
3. If operation is performed as soon as the diagnosis is made, the chance of curing the patient is greater than if it is delayed until after roentgen therapy has been given.
4. Insufficient data are available to permit evaluation of the merits of postoperative roentgen therapy.

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ABSTRACT OF DISCUSSION

DR. JAMES T. PRIESTLEY, Rochester, Minn.: The results which Drs. Ladd and White have reported are definitely superior to any others recorded in the literature. This fact in itself speaks for their methods of treatment. The important point discussed by the authors, concerning which divergent opinions exist, pertains to the value of irradiation in the treatment of Wilms' tumor. Drs. Ladd and White object to preoperative irradiation because metastasis might occur during administration of roentgen therapy. That preoperative irradiation does facilitate surgical removal of the tumor by decreasing

5. Ladd, W. E.: Embryoma of the Kidney (Wilms' Tumor), *Ann. Surg.* 108:885-902 (Nov.) 1938.

1. Priestley, J. T.: Survival Following Removal of Malignant Renal Neoplasms, *J. A. M. A.* 113:902 (Sept. 2) 1939.
2. Campbell, M. F.: Primary Malignant Tumors of the Urogenital Tract in Infants and Children, *J. A. M. A.* 109:1606 (Nov. 13) 1937.
3. Higgins, C. C., and Shively, F. L., Jr.: Malignant Renal Neoplasms in Children: Review of Twenty-Six Cases, *Arch. Surg.* 42:386 (Feb.) 1941.
4. Kretschmer, H. L.: Malignant Tumors of the Kidney in Children, *J. Urol.* 39:250 (March) 1938.

its size is a definite advantage to most surgeons. In order to determine what effect irradiation might have on ultimate results, a recent review has been made of all cases of Wilms' tumor in which nephrectomy was performed at the Mayo Clinic prior to 1937. This permits of a follow-up period of five years in order to determine end results. According to the experience of Drs. Ladd and White, a two year follow-up should provide adequate information in this regard. Although the number of cases in this series is too small to permit definite conclusions, some suggestive evidence with regard to the value of irradiation may be obtained. There were 39 patients in all, 6 of whom have survived five years or more after operation, a survival rate of 15 per cent for this period. There were 13 patients on whom nephrectomy alone was performed; 1 of these (8 per cent) survived five years or more. There were 3 patients for whom preoperative irradiation and nephrectomy were employed; not one of these is living at present. There were 11 patients for whom nephrectomy and postoperative irradiation were employed; 2 of these (18 per cent) have survived to the present time. There were 12 patients for whom preoperative irradiation followed by nephrectomy at an appropriate time and subsequently postoperative irradiation were employed; 3 of these (25 per cent) are still living. From this limited experience irradiation seems to enhance ultimate results when utilized in association with nephrectomy in the treatment of Wilms' tumor. It should be emphasized that irradiation alone without surgical intervention does not constitute adequate treatment for these lesions. Perhaps it would be well to compromise and utilize preoperative irradiation only when the tumor is so large when first examined that nephrectomy would be difficult or almost impossible. If a small Wilms' tumor, which unfortunately is seldom seen, should be encountered, perhaps one could proceed directly with nephrectomy. In all cases it seems advisable to me to use extensive postoperative irradiation.

DR. MONROE WOLF, New Orleans: The rarity of this condition in early childhood may be cited by presenting the incidence in two of New Orleans' largest hospitals, Charity Hospital and Touro Infirmary. At Touro Infirmary for the period January 1933 through April 1941 there was a total admission of 86,022 patients, 4 with Wilms' tumor, 2 each white males and white females. Two of these patients were apparently well three years after operation, an unusually high incidence of apparent cure. At Charity Hospital from July 1, 1937 until May 1, 1941 the total admission was 230,300 patients, of whom 6 had Wilms' tumor, 2 white male, 1 white female, 1 Negro male and 2 Negro females. Three of these patients were admitted during the past three months. There have been no three year survivals in this series. As a urologist I wish to impress the difficulty in differentiating these tumors from an extrarenal retroperitoneal new growth.

DR. WILLIAM E. LADD, Boston: Dr. Priestley apparently has in mind the danger that somebody will consider that the sole treatment for embryoma of the kidney is roentgen therapy, and I think he is wise in bringing that point to our attention. There is an added danger in this regard because it is sometimes difficult to differentiate between the retroperitoneal blastoma and the embryoma of the kidney. The neuroblastoma is rather a strange tumor; there are on record a certain number of cases of neuroblastoma that have been cured by roentgen therapy, and there are a few cases—Dr. Cushing reported 1 many years ago—that have regressed without any treatment. We have had 1 patient at Children's Hospital, and we have 5 or 6 more who are well after many years following roentgen therapy. But we would not give roentgen therapy without being sure of our diagnosis. I think it is a great mistake ever to give roentgen therapy for any of these abdominal tumors unless one knows what one is treating. Regarding the pyelograms that Dr. Wolf showed, we have a feeling that the neuroblastoma, the retroperitoneal blastoma, is a little bit more likely to push the renal pelvis laterally, whereas the embryoma is more apt to push it medially, upward or downward. There are enough exceptions so that I don't believe one can differentiate between the two by the pyelogram alone.

LEGAL AND THERAPEUTIC ASPECTS OF SYPHILIS AND PREGNANCY

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More than twenty-five years have elapsed since the first legal attempt was made to control the transmission of venereal disease from one partner in marriage to the other. This early legislation was faulty and failed to produce the desired result, since it did not apply to both sexes and did not require microscopic or serologic tests as aids in diagnosis. In the last five years the public has been made violently conscious of the venereal disease problem (and particularly so with regard to syphilis) both from the standpoint of the individual and from that of the community, the state and the nation as a whole. Partly because of this and partly because public health authorities have instituted an active anti-venereal disease campaign, many state legislatures have enacted statutes to forbid the issue of marriage licenses to persons suffering from such diseases unless it was felt that the condition is not communicable. As a natural corollary to this effort, laws have also been passed requiring that physicians perform a serologic test for syphilis on all pregnant women under their care. The first of the new premarital examination laws went into effect in Connecticut in 1936. At present thirty-one states have enacted some sort of similar legislation, while in twenty antepartum examination laws are in effect. It seems of particular interest that all this legislation has been passed chiefly through the efforts of lay organizations and that physicians, both individually and as a group, rarely have been consulted as to the content of the law or its probable effects. Indeed the subject has become one of considerable acrimonious debate among physicians and venereal disease authorities as well.

A brief discussion of the premarital examination laws may first be undertaken. These laws differ in many ways. Some require clinical and microscopic examinations in an effort to establish or rule out the presence of gonorrhea. Except when there are obvious signs and symptoms the diagnosis of this condition at the present time is so unreliable as to leave little to recommend its inclusion in a statute. A false positive diagnosis is made infrequently, and a true positive reaction is missed in the majority of cases. With syphilis the situation is considerably different. Examination by a licensed physician of both the prospective bride and the prospective groom, including serologic tests for syphilis, is required in twenty states. Four states require examination of the groom only. Six other states prohibit the marriage of persons with venereal disease, some of them requiring a personal affidavit as to freedom from infection but making no specification as to examination.

Obviously many premarital examination laws have been passed hastily and without due regard to the transmission of syphilis as it is understood by syphilologists. It follows that they not only will fail to attain the desired end but will render all such legislation, both present and future, unpopular with the public.

The American Social Hygiene Association, one of the most important agencies sponsoring legislation

governing premarital examination, recognizing the many defects in present statutes, has recently suggested a so-called ideal law.¹ This law, for reasons previously stated, is limited to syphilis. It requires that both applicants for a marriage license be examined for syphilis by a licensed physician. The examination should be both clinical and serologic, the serologic test being of a type approved by the state health department. The tests should be made not more than thirty days before the license is applied for, and the license when issued should be valid for not more than sixty days. The blood test should be done without charge on request through the local health department. The filing of a certificate by a physician and the laboratory statement may be waived by the judge of a proper court because of an emergency or for some other cause. With this rare exception, the physician must file a certificate of examination accompanied by the report of the laboratory test, which includes the name and the address of the applicant, the date and type of test but not the result. The result of

marize these briefly. Proponents of such legislation have advanced the following points:

1. Syphilis is frequently transmitted through marriage when one partner is infected. Frequently the diseased person is unaware of his or her infection. The vast majority of pregnant women found repeatedly to have a positive serologic reaction give a history completely negative for signs and symptoms of syphilis.
2. The most valuable single means of diagnosing syphilis, particularly as far as the general practitioner is concerned, is the serologic test.
3. Premarital blood tests will reduce the incidence of the transmission of syphilis to the spouse and to the children.
4. Untreated syphilis not infrequently results in the incapacitation or early death of one partner. Both partners should be aware of this possibility before marriage. If incapacitation results, support for the family may have to come from public funds, and thus the problem may become of interest to the state from the standpoint of relief. Furthermore, the knowledge that syphilis is present in one spouse frequently is obtained only after marriage and often results in divorce.
5. Premarital tests will encourage prompt and thorough treatment of syphilis.

Arguments against premarital legislation may be summarized as follows:

1. Serologic tests for syphilis may give nonspecific or falsely positive results. Leprosy, malaria and acute infectious mononucleosis frequently cause positive serologic reactions. More rarely, false positive reactions have been recorded in the presence of tuberculosis, neoplasms, jaundice and fever. As has been stated by one authority:² "To deny a man or woman the license to marry on the evidence of a positive blood reaction alone is risky and seriously open to criticism and objection. In the absence of clinical manifestations or a history at least suggestive of syphilis . . . the serologic test should be indisputable and based not on a single but on at least two positive reactions by two or more methods."

2. Positive reactions alone do not always indicate a danger to marriage. This is especially true if the disease is of long standing or has been thoroughly

treated. The question as to whether a person is or is not infectious to his partner in marriage frequently baffles the specialist and hence is one on which the general practitioner is usually incapable of deciding.

3. Withholding permission to marry will have little effect on the class of society in which the incidence of syphilis is highest and will result in common law marriages and sexual promiscuity.

4. In the incubation period and the primary stage of syphilis, the serologic reaction is often negative. Many men feel they must have a last fling before settling down and may contract syphilis between the time of the blood test and the marriage itself.

5. Emphasis on the legal rather than the medical approach to control is a danger. Premarital examination laws are the forerunners of other laws. The problem of tuberculosis has been well solved without legislation. If marriage is to be under legal control, why not do the job completely and legislate against even greater problems, such as feeble-mindedness?

An effort to assay the value of premarital examination legislation will now be made with respect to

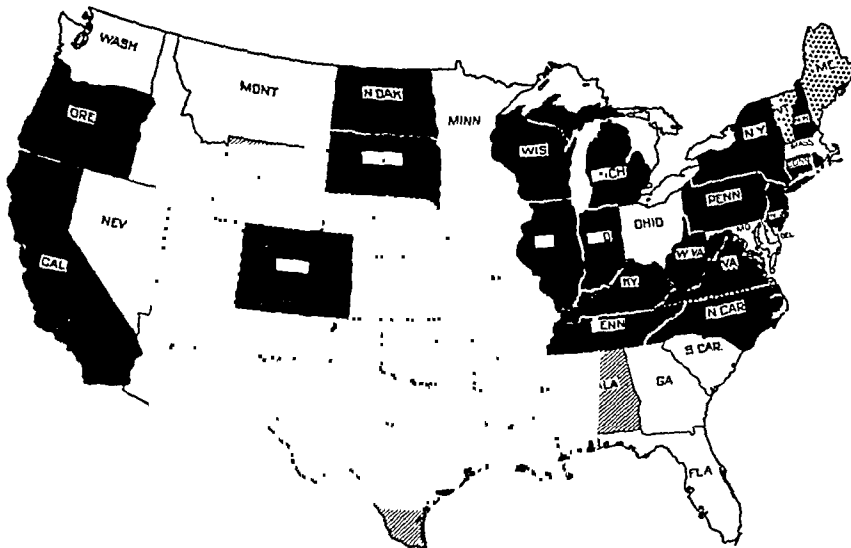


Fig. 1.—Protecting marriage from syphilis. Legislative status of premarital health examinations, 1940. Twenty states (black) require examination by physician of both bride and groom, including blood test for syphilis. Four states (white) require examination by physician of groom only for freedom from venereal diseases. Six states (stippled) prohibit marriage of persons with venereal diseases, some require personal affidavit of freedom from venereal diseases, no examination specified. (From the American Social Hygiene Association, Inc., 1790 Broadway, New York, Oct. 1, 1940.)

the test should be sent to the physician, who forwards it to the health department to be filed and to be used only if further action is necessary to protect the public health. The decision as to issuance of the certificate giving permission for the marriage license should be in the hands of the physician, and he may certify the applicant, even though the test gives positive results, if he does not feel that the disease is infectious. Otherwise treatment must be given and the immediate issuance of the certificate refused. The licensing authority should attach to the license a statement that the applicants have conformed with the law. The person performing the marriage must return the certificate and the marriage license together with his own affidavit. Finally the "ideal law" provides a penal clause and an appropriation to the state health department to cover necessary expenses.

As has been stated, many arguments have been offered, both pro and con, as to the advisability of premarital examination laws. It seems proper to sum-

1. Johnson, Bascom: J. Soc. Hyg. 24: 477 (Nov.) 1938; 25: 285 (June) 1939.

2. Kolmer, J. A.: Laws Requiring Premarital and Pregnancy Tests for Syphilis. Reasons For and Against, J. A. M. A. 112: 2105 (June 10) 1939.

the number of cases in which previously undetected venereal disease is diagnosed, the outcome in cases in which a marriage license is refused and the opinion of the agency administering the law, namely the health department. In May 1940 Mary Edwards published a summary of 631,206 serologic tests done in fourteen states under the new laws. Definitely positive results were obtained in 8,605 instances, or 1.4 per cent. It was estimated that from 70 to 90 per cent of the persons with positive reactions had been previously unaware of their infection. The incidence of positive reactions was about equal for the two sexes, while the ratio of Negroes to white persons varied between 7 to 1 and 20 to 1. Slightly more than half of the total group with positive serologic reactions were granted marriage licenses on the basis of noncommunicability of their disease. Few figures are available as to the behavior of persons refused licenses. A report from New Jersey on 113 applicants states that 71 did not marry, 18 married in other states and the remainder could not be found. Furthermore, more than half were under treatment three months later. It seems to be common experience that the marriage rate in most states rises sharply just before the law goes into effect and falls equally rapidly afterward. This decline, however, has not been found to last more than one or two years, when it rises again to the previous normal rate. It has not been possible for me to seek an expression of opinion as to the advantages and disadvantages of premarital examination laws from the standpoint of the directors of health in the several states employing them. However, I have gathered that their approval is in direct proportion to the closeness with which their state law approximates the so-called ideal law, which has already been cited. Furthermore, it is difficult for me to frame an exact statement of my personal opinion. Every physician will agree that the intent of premarital examination laws, to prevent the spread of syphilis through marriage, is completely appropriate and necessary. The difference of opinion comes as to the manner by which the end may be achieved. Must it be by prohibitive legislation or can it be best accomplished by the medical profession itself with the aid of enlightened public opinion? It seems proper to end this portion of the discussion by quoting briefly from two eminent specialists in venereal disease. J. E. Moore,³ of Baltimore, stated that

emphasis on the legal rather than on the medical approach to the control of syphilis is likely . . . to do . . . more harm than good. Reform by legislative fiat is a procedure which the American people have more than once adopted as a panacea, only quickly to tire, not only of the law itself but of the end at which it was aimed. . . . Perhaps this type of legislation is desirable in the Utopian state, . . . but so far it has not been the American way.

Secondly, Nelson,⁴ of Boston, has summarized his opinion as follows:

Premarital examination, not only for syphilis but for all conditions which make marriage unwise and unsafe, will amount to something and will be conducted on an honest basis when candidates for marriage go to their doctors because they really want to be examined, tell the truth, submit to thorough physical examinations, and accept the physician's opinion as the best opinion that he can give, not as a guaranty. In the meantime,

it is unjust to permit the public to think that it is getting something which cannot possibly be delivered and to put the medical profession in the position of having to swear to the truthfulness of the applicant and the accuracy of the laboratory, and of having to stretch an opinion until it becomes a certificate.

Antepartum examination legislation has created much less argument among physicians and health officers. The laws refer only to syphilis and are practically identical in the various states possessing them. The American Social Hygiene Association has suggested an "ideal law" for antepartum examination also.¹ It is brief and states that a serologic test for syphilis must be made at the time of the pregnant woman's first visit to her physician. The test must be a standard one done in an approved laboratory. On request, the examination will be made without charge by the local health department. The birth certificate of the child should state whether the test has been made; if it has, the date, and if it has not, the reasons why, should appear. The result of the test should not appear on the certificate. Arguments in favor of such a law are:

1. Blood tests during pregnancy represent an excellent method of case finding. Provided a sensitive method is used, it may be said that a definitely positive reaction, verified on repetition, is indicative of syphilis regardless of the history or physical status.

2. The detection of syphilis and its prompt treatment during pregnancy will reduce to a minimum the danger of the offspring being born with congenital stigmas. As a corollary, this often results in more treatment for the woman, since many asymptomatic persons lapse in their treatments between pregnancies but are willing to submit to them while pregnant in order to protect the unborn child.

3. A positive serologic reaction during pregnancy places the physician on the alert and increases the likelihood of repeated examination after birth of the child who otherwise might be neglected in this regard.

4. The detection of syphilis in the pregnant woman will lead to its detection and treatment in other members of the family.

Arguments against antepartum serologic tests are merely the danger of false positive reactions and the fact that the woman who suspects that she has syphilis may go without care or be delivered by a midwife.

Few figures are available as to the practical results of antepartum tests. A report from New Jersey stated that in 1.38 per cent of 19,752 serologic examinations done on pregnant women the results were positive. At the Johns Hopkins Hospital positive reactions were obtained in about 2 per cent of white clinic patients as contrasted with 20 per cent of Negroes. It should be stated that at this hospital the tests were routine and were not compulsory. It seems clear that an attempt to diagnose syphilis is made much less frequently in rural than in urban communities and for mothers delivered at home as contrasted with those delivered in hospitals. Among a group of New Jersey mothers, 56 per cent had been examined and tested for syphilis (according to law) before the seventh month of pregnancy, while a comparative figure of 40 per cent was obtained in New York.

It would seem that much less argument can be brought to bear against antepartum than against premarital examination legislation. Moore, in a personal communication to me, expressed the belief that laws providing for antepartum examination are unnecessary, on the ground that serologic tests during pregnancy are routine in hospitals and in the practice of intelligent

3. Moore, J. E.: *Am. J. Syph., Gonorr. & Ven. Dis.* 23: 386 (May) 1939.

4. Nelson, N. A.: *Am. J. Syph., Gonorr. & Ven. Dis.* 23: 288 (May) 1939.

physicians. Accordingly the law would affect only the few women who are cared for by midwives and ignorant physicians. I cannot agree. In many states whose population is predominantly rural the great majority of women are delivered in their homes. For a large proportion of women so delivered serologic tests for syphilis are the exception rather than the rule. I can see no real argument against antepartum examination legislation except that of expense and wish to go on record as recommending its further adoption.

Until recently syphilis was the largest single cause of premature labor, stillbirth and fetal death. Twenty years ago at the Johns Hopkins Hospital 34.4 per cent of all stillbirths and neonatal deaths were due to this cause, and this figure did not include the large number of infants born alive with congenital syphilis and surviving the neonatal period. Even now 10 per cent of all such deaths at this hospital are due to syphilis, although most of these have occurred when the mother has not received antepartum care. At present congenital

proved. The chances of syphilis being passed on to the child are greatest if the disease is acquired shortly before, at the time of or soon after conception. If the infection occurs after the sixth month, the child will presumably be normal. Furthermore, the probability of transmission in utero diminishes as the number of years between infection and pregnancy increases. These last two statements do not mean that under the conditions stated treatment may be omitted with complete safety to the child.

Until recently it was generally believed that intensive antisyphilitic treatment was no more dangerous to the pregnant woman than to the nonpregnant woman. Minor reactions were disregarded, although a sharp watch was kept for possible hepatic or renal injury. A short time ago this theory was challenged and it was stated that reactions in general, and acute yellow atrophy of the liver in particular, occurred much more frequently after treatment during pregnancy than at any other time. It is probable that further study (preferably statistical) must be done before this question may be regarded as settled. It is, however, the opinion of the syphilis clinic at the Johns Hopkins Hospital that pregnancy itself bears no relation to the incidence and severity of therapeutic reactions.

The treatment of syphilis during pregnancy is primarily concerned with the unborn child, to prevent its becoming syphilitic if possible, and otherwise to treat an already existing infection. A brief outline of the routine proposed by Moore and placed in operation at the Johns Hopkins Hospital follows:

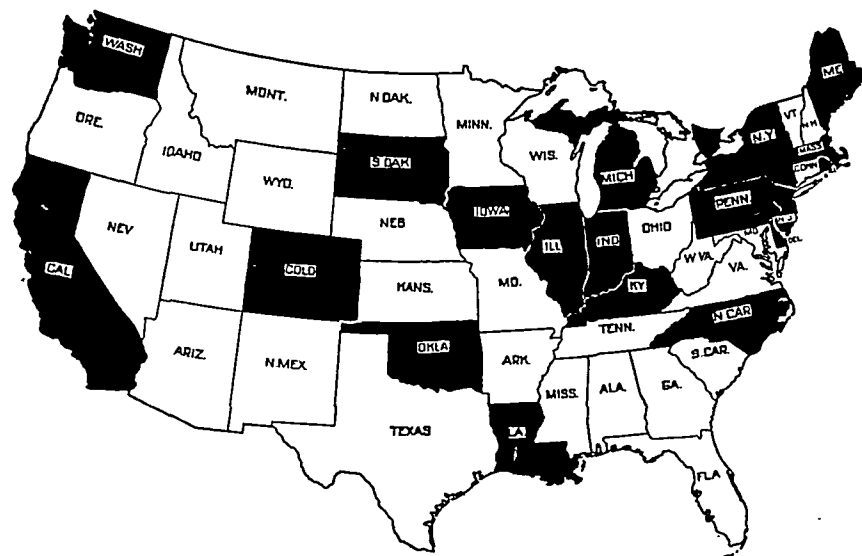


Fig. 2.—Protecting babies from syphilis: Status of legislation requiring physicians to examine pregnant women, 1940. Nineteen states now have such laws. (From the American Social Hygiene Association, Oct. 1, 1940.)

syphilis must be considered as almost entirely preventable, provided routine serologic tests are obtained on all pregnant women and vigorous and adequate treatment is given all those with positive reactions.

Syphilis in pregnant women is usually latent, and only a small minority have a suggestive history or definite clinical signs. Diagnosis, then, must generally depend on serologic study, and a strongly positive reaction verified by repetition must be considered diagnostic. Despite opinion to the contrary, it seems definite that pregnancy does not cause false positive reactions but occasionally results in a false negative reaction. In the Johns Hopkins Hospital series there were 107 patients with false negative reactions, of whom 51 had received varying amounts of therapy and 56 previously had been untreated. It is generally felt that with a negative serologic reaction but with a history suggestive of syphilis, particularly if this includes one or more deliveries of premature or stillborn infants, treatment "on suspicion" is justified. If the husband has syphilis but the reaction of the wife's blood is negative, particularly if the pregnancy ensues soon after marriage, the blood test should be repeated at frequent intervals but no treatment given unless syphilis of the mother becomes

1. If the patient begins treatment before the fifth month, eight intravenous injections of arsphenamine (0.3 Gm.) or neoarsphenamine (0.6 to 0.75 Gm.) are given at weekly intervals, followed by four to six intramuscular injections of a bismuth compound (0.2 Gm.). This routine is repeated to the end of pregnancy.

2. If treatment is begun after the sixth month, the same schedule is used for arsphenamine, but six to eight injections of a bismuth compound are to be given on the same days on which the arsenical is administered.

3. If treatment is started after the eighth month, the foregoing schedule is followed, except that the interval between treatments is shortened to four or five days.

Treatment should never be relaxed, even though it has been started early in pregnancy. Furthermore, the routine should be arranged so that an arsenical is employed for the last three to four weeks prior to the estimated date of confinement. Obviously, therapy should be continued in the usual manner after the pregnancy is over. Finally, it is of the utmost importance that the child be examined carefully and watched closely. The examination should include a serologic test for syphilis on the cord blood, microscopic examination of the placenta, roentgenograms of the long bones, dark field examination of the vessels of the umbilical cord and pediatric clinical and serologic follow-up studies.

The results to be obtained from such a system of treatment are best illustrated by the accompanying table,

taken from a publication by McKelvey and Turner.⁵ Obviously even a small amount of treatment increases the probability of a normal infant's being born. It seems evident that if thirteen to fourteen injections totaling about 4 Gm. of arsphenamine can be administered prior to delivery the danger of congenital syphilis may be eliminated. It is interesting to note from the study of McKelvey and Turner that of 167 babies born with congenital syphilis the mothers of 100 had received no antepartum therapy. Only 16 mothers had received 2 Gm. or more of arsphenamine or its equivalent, and most of these had been treated irregularly or had had a lapse of treatment during the last few weeks of pregnancy. Favorable results to the baby are enhanced if treatment of the mother has been instituted before pregnancy. However, even a large amount of such treatment does not render safe its omission during the gestational period, especially in the case of the primigravida. Combined treatment, including the administration of a heavy metal, gives better results than the use of arsenicals alone. Generally, if the treatment before pregnancy has not been adequate, if the serologic reaction remains positive or if there is clinical evidence

*Outcome of Pregnancy with Varying Amounts of Antisyphilitic Treatment: No Treatment Prior to Pregnancy
(Turner and McKelvey)*

Treatment During Pregnancy	Number of Pregnancies	Condition of Child at Birth, Percentage		Ultimate Status of Child Known, Number of Children	Of These, Percentage	
		Living	Dead		Normal	Syphilitic
None.....	263	54.1	45.9	155	35.4	64.5
Arsphenamine						
Less than 1 Gm.	118	89.0	11.0	78	73.0	27.0
1-2 Gm.	127	90.6	9.4	94	79.7	20.2
2-3 Gm.	85	91.8	8.2	62	83.8	16.1
3-4 Gm.	33	100.0	0.0	24	87.5	12.5
4-6 Gm.	19	94.7	5.3	13	100.0	....
Total.....	650			426		

of infection, treatment during pregnancy is imperative. Completely adequate treatment, with repeatedly negative serologic reactions, probably protects the child completely even though therapy during pregnancy is not administered.

SUMMARY

The routine employment of serologic tests for syphilis by most hospitals and many physicians, together with the intensive treatment of all patients with positive reactions, has greatly diminished the incidence of antepartum transmission of the disease. Congenital syphilis will practically if not entirely disappear as soon as all pregnant women consult their physicians at a relatively early stage and the value of routine blood tests and treatment becomes universally understood.

ABSTRACT OF DISCUSSION

DR. CARL P. HUBER, Indianapolis: Dr. Peckham's paper presents an admirable summary of present opinion concerning premarital and antepartum serologic tests. In most states, legislation of this type has been so recently enacted that its effect is difficult of evaluation. In Indiana, premarital serologic tests have been required by law since March 1, 1940. During the first year, 66,326 tests were performed, with 1,125 positive reactions, an incidence of 1.69 per cent. The Indiana law corresponds to the "ideal law" suggested by the American Social Hygiene Association and, as in many other states, was adopted in great measure at the demand of the public. There has been

5. McKelvey, J. L., and Turner, T. B.: Syphilis and Pregnancy. *J. A. M. A.* 102: 503 (Feb. 17) 1934.

no great difficulty in its administration. Sufficient time has not yet elapsed to make it possible to evaluate the effect of these tests. It seems pertinent, however, to point out additional values which they may have other than in direct case finding. Such laws are of potential educational value in venereal disease control. A law requiring, as these do, that the partners in a contemplated marriage consult a physician for examination also offers an opportunity for a phase of preventive medicine that is too frequently neglected by both the public and the medical profession. It is an ideal chance to perform a complete premarital examination and to give appropriate advice concerning the medical and sex hygiene problems of marriage and future pregnancy. It is one of the primary steps in any complete program of maternal welfare. Such an opportunity routinely followed up will increase many times the value of an already justifiable law. From March 1, 1940 to Feb. 28, 1941 a total of 31,691 serologic tests were reported on antepartum patients in Indiana by the state board of health and by the approved laboratories throughout the state. This represents slightly more than one half of the number of births which occurred during the same period. There were 520 positive tests, an incidence of 1.64 per cent, almost identical with the incidence in the premarital group. The Indiana law does not require that separate reports be filed on this group of patients, so that in many additional instances blood specimens were not listed as from antepartum patients. The state has looked on the antepartum law as primarily educational in nature. There is no penalty for not complying with it. Its value depends not only on the administration of adequate treatment in positive cases but also on the stage of pregnancy at which the blood is obtained for testing. From that point of view continued education concerning the value of early antepartum care is essential. The effectiveness of the law requiring an antepartum blood serologic test depends, then, on the caliber of antepartum care in any community. The value of this type of law would be increased if an effective means was established to insure adequate follow-up care and treatment for all infants born of mothers with a positive serologic test.

DR. HERMAN BEERMAN, Philadelphia: In a recent evaluation of premarital legislation, Sheppe found 1.3 per cent positive reactions among 677,832 examinations in thirteen states. A large percentage of such patients have latent syphilis, the diagnosis of which depends chiefly on the blood serologic reactions. These reactions are not infallible, especially in the woman. By the application of such a scheme of study for the doubtful case as proposed by Moore and his associates, one can largely eliminate much of the uncertainty in serologic diagnosis. This scheme, briefly, consists in careful physical examination for syphilis and other infections capable of producing a biologic false positive serologic test; a search for malarial parasites; examination of blood smears, and blood tests for infectious mononucleosis; determination of the sedimentation rate; repeated blood serologic tests by different techniques in different laboratories and, if possible, by a quantitative procedure and by special antigens both specific and nonspecific; the performance of the as yet unverified "Kahn verification test"; serologic follow-up; family study, and a cerebrospinal fluid examination. Of course, a cerebrospinal fluid examination should be avoided in a pregnant woman. The provocative procedure is usually worthless, and treatment should be withheld until a definite diagnosis is established. There seems, as Dr. Peckham points out, to be little dispute as to the advisability of antepartum blood testing legislation. I wish not only to support his recommendation of it but to ask for at least two blood tests in pregnancy: one at the time of registration, to detect syphilis acquired anteconceptionally, and one later in pregnancy, about the seventh or eighth month, to uncover syphilis acquired by the pregnant woman during pregnancy. A young white primipara at the time of registration had a negative blood serologic reaction. About three months after registration she had an eruption, which was diagnosed by a dermatologist as a nonsyphilitic condition. No blood tests were made. The eruption persisted, and after delivery at another institution it

was found that the offspring and the mother both had positive blood serologic reactions. On examination, the mother and the father both were discovered to have early infectious syphilis. I agree with the schedule for antepartum antisyphilitic therapy which Dr. Peckham proposes. If syphilis is discovered in the pregnant woman, the possibility of the child's becoming infected depends on several factors. Among these are the age of the infection in the mother, whether she is seropositive or seronegative, the amount and kind of therapy, and the time in pregnancy it is administered. Recent infections and seropositivity are generally less favorable. The more arsenical administered, and the earlier in pregnancy the treatment is begun, the more favorable the outcome with regard to the child. According to the best authority, it is recommended that every pregnant syphilitic woman be treated regardless of her disease and her serologic status, during every pregnancy. In regard to treatment reactions routine blood pressure and urine examination and common sense go a long way in making for safety in the treatment of the pregnant syphilitic woman. Our first year's experience in the Family Syphilis Clinic of the Pennsylvania Hospital, Philadelphia, organized to facilitate early and adequate treatment for pregnant syphilitic women, in which the obstetrician from the Lying-in Hospital and the syphilologist work hand in glove, illustrates the value of adequate antepartum antisyphilitic therapy in the prevention of congenital syphilis. These good results on a relatively small experience can be multiplied by close obstetric and syphilologic cooperation.

DR. CHARLES H. PECKHAM JR., Cooperstown, N. Y.: I should like to state that, whereas twenty years ago it was almost universally agreed that syphilis was the chief cause of premature delivery and stillbirth as well as one of the most common causes of fetal and neonatal mortality, there is a tendency at the present time to feel that the problem has been solved. Recently I have had the opportunity of looking up 1,000 consecutive fetal deaths that occurred in the obstetric service at the Johns Hopkins Hospital over a period of the last ten years. Even at this recent date 10 per cent of the total 1,000 deaths were due to syphilis.

CHEMOTHERAPY IN INFECTIONS OF THE BONES AND SOFT TISSUES

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AND

PAUL R. HARRINGTON, M.D.

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In January 1941, at the ninth annual meeting of the American Academy of Orthopaedic Surgeons in New Orleans, a report was made describing the results obtained in the treatment of infections of bone by the systemic administration and the local implantation of sulfathiazole. Since the general principles on which this method was based were thoroughly covered in this preliminary report, this discussion is limited to the presentation of additional data on the use of sulfathiazole in the treatment of infections in bones and soft tissues, which data have accumulated since that time.

The plan of treatment for osteomyelitis advised in the preliminary report was as follows: first, systemic administration of sulfathiazole in sufficient dosage to secure a blood concentration of approximately 5 mg. per hundred cubic centimeters several days before operation, thorough débridement of the infected area, implantation of sulfathiazole crystals into the wound, primary closure and application of a plaster dressing for fixation. In the management of compound fractures, the same procedure was followed with one modifi-

cation: in fresh compound fractures, since débridement cannot be delayed in order to secure a satisfactory blood concentration of the drug, sodium sulfathiazole was administered intravenously. In this way a fairly high blood concentration could be built up very rapidly. In old compound fractures, the preliminary treatment carried out was the same as that used in osteomyelitis.

In compound fractures, the local treatment was carried out as follows:

1. A tourniquet is applied to the extremity to be operated on and remains in place until the plaster dressing is applied for immobilization following the operative procedure.
2. The superficial tissues are thoroughly cleansed and washed with ether, and all foreign material is removed.
3. The cutaneous edges of the compound wound are excised for a distance of at least $\frac{1}{4}$ inch, all devitalized skin being removed.
4. The soft tissues are then thoroughly debrided, all traumatized and devitalized tissue being removed. This is the most important step of the entire procedure.
5. All detached bone fragments are removed.
6. The bone ends are brought into alinement and held by a bone clamp.
7. Internal fixation is applied, a silent metal such as vitallium, being used.
8. The wound is cleansed with warm saline solution and thoroughly dried.
9. Sulfathiazole powder is now introduced into the wound. This is most effectively done by using a nasal insufflator, since in this way the powder is deposited in a thin layer over the bone and into the most minute crevices of the wound. Generally, from 1 to 3 Gm. of powdered sulfathiazole is sufficient.
10. The deep soft parts are sutured with interrupted catgut in such a manner as to bring them into as close contact as possible with the denuded area of bone. Following the suturing of the deep layer, additional sulfathiazole is introduced into the wound, and the superficial structures are closed with interrupted sutures. The skin is closed with cotton thread. A firm dressing is applied over the wound, and if there are any areas of denuded skin a thin layer of petrolatum gauze may be applied over these wounds. Finally, a plaster dressing is applied adequately to immobilize the extremity.

It should be clearly understood that the plan of local treatment described refers only to injuries in which the wound and the soft parts are of such character as to permit closure without tension and on patients who are to remain under the supervision of the surgeon. It could not properly be applied in war casualties in an action or movement, nor when there is extensive loss of soft parts. In this type of case, the wound should be left open and tamponed after the local introduction of sulfathiazole.

The first time that this procedure was used was Aug. 1, 1940, and since that time 56 patients have been treated by this method. This series is divided into subacute and chronic osteomyelitis (38 cases), compound fractures (16 cases) and miscellaneous infected wounds (2 cases). The latter group represents (1) an infected sinus in the thigh of about eight years' duration and (2) an infected ulcer of the foot. In both of these cases healing was by primary intention.

In the 56 cases reported, the age range was from 2 to 70 years. The average age was 24.6 years. The average total dose of sulfathiazole by mouth was 57.4 Gm. and the average daily dose was 5.3 Gm. The average blood concentration was 4.3 mg. per hundred cubic centimeters of blood. The average amount of the drug used locally was 1.9 Gm. The average healing time was twenty-one and six-tenths days.

The number of cases of chronic osteomyelitis was 38. Two unhealed cases were listed in the preliminary report—one an osteomyelitis of the femur of *Escherichia coli* origin, and the other an osteomyelitis of the mandible. The first of these cases, by the alternate use of the Carrel-Dakin method and sulfathiazole, healed in fifteen weeks and has remained healed. The patient with osteomyelitis of the jaw was reoperated on and a small piece of sequestrum was found and removed. Since then the wound has remained healed.

We wish at this time to report an additional case of osteomyelitis which failed to heal by primary intention. This case was one of osteomyelitis of the femur of thirty years' duration during which time numerous operations had been performed to clean up the condition. At the time it was operated on more than half of the circumference of the femur was removed for approximately two thirds of its length. Following the operation the Carrel-Dakin treatment was employed for two weeks, at the end of which time the wound was closed with introduction of sulfathiazole powder. The wound broke down in about two weeks and the Carrel-Dakin treatment was again administered for three weeks. At the end of this period, the Orr method of treatment was used. The cavity was, however, thoroughly insufflated with sulfathiazole powder before the petrolatum gauze was introduced and a cast applied. The Orr method was used at this time because economic conditions made it desirable for the patient to leave the hospital and return home. In this case healing is rapid and the result should eventually be successful but with a greatly prolonged healing time compared to the others.

The cases of compound fractures numbered 16. The age range of the patients was from 10 to 66 years, the average age being 36.9 years. The average total dose of sulfathiazole by mouth was 566 Gm. The mean average daily dose was 66 Gm. The average blood concentration was 4.7 mg per hundred cubic centimeters of blood. The average amount of the drug used locally was approximately 2.6 Gm.

Of interest is the comparison of blood concentration with the use of the sodium sulfathiazole given intravenously to that of the sulfathiazole given by mouth. Six-hundredths Gm of sodium sulfathiazole per kilogram of body weight was given intravenously, the average dose being 4.1 Gm. The average blood concentration after the lapse of five minutes was 47.5 mg per hundred cubic centimeters, one hour 12.15 mg, two hours 10.75 mg, three hours 7 mg and four hours 5.25 mg.

The mean average daily dose of sulfathiazole given by mouth was 66 Gm. The average blood concentration after the lapse of one hour was 4.2 mg per hundred cubic centimeters, two hours 4.1 mg, three hours 5 mg, four hours 5.9 mg and eight hours 4.7 mg.

The temperature, pulse, respiration and combining power of carbon dioxide were not materially affected by the one dose of sodium sulfathiazole that was given. Crystals of the drug were recovered in the urine at the end of one hour, but otherwise the urine was normal throughout the concentration period.

Eleven cases were of acute compound fractures and operation was performed within twenty-four hours. In 5 cases the compound fractures were old with persistent infection. The mean average healing time for this series was twenty-four and eight-tenths days. (Two cases of this series are of too recent occurrence to be reported, but both seem destined to satisfactory healing. Three other cases are to be reported later.)

CONCLUSIONS

In a series of 56 cases of infected bone and soft tissue the treatment employed was the administration of sulfathiazole by mouth or sodium sulfathiazole intravenously, thorough débridement of the focus and the introduction of sulfathiazole powder into the wound. In 53 cases healing was by primary intention with an average healing period of twenty-one and six-tenths days. Two cases should be termed successful but with a greatly prolonged healing time as compared to the others. One case we consider a failure as regards this method, but the case is still under treatment.

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ABSTRACT OF DISCUSSION

DR FRANCIS M. MCKEEVER, Los Angeles. I am not qualified by large experience with chemotherapy in fractures to discuss this paper. In my series of compound fractures there were 77 patients. The small puncture compound fractures were not a great problem. Most of them healed primarily. It had been my impression that a good débridement gave a high percentage of good results. However, in the large lacerated wounds the percentage of primary healing was not high. It was a disappointment. A small group was treated by local chemotherapy and by closing the wound, and, although this group is very small, it is suggested that the method is effective and that the sulfanilamide drug should be used locally as well as systemically. As far as the method of treating old osteomyelitis by dissecting out the sinuses and filling the wound with sulfathiazole is concerned, I have tried it in only 5 cases. I must say that despite my skepticism it has worked in 5 instances consistently. I should like to ask the authors what attitude they take toward the puncture wound fracture. Do they feel that it is worth while to open this wound widely so that the chemical can be disseminated throughout the injured tissue? I should also like to ask whether in their longer follow-up of the cases of chronic osteomyelitis some of the wounds which were healed early have later on formed abscesses and drained.

DR ROBERT W. JOHNSON, JR., Baltimore. It would seem that we have a problem here of two types of injury, severe soft part injury with fracture, the severe compound fracture, and the puncture wound fracture. I think we are pretty well convinced that the puncture wound fracture had dynamite in it, potentially but not surely, whereas the severe compound fracture is a tremendous problem for us all the time. I was struck by an omission on my part to use the intravenous drug in these cases. I think that is a definite protection which should be offered to the patient of which the authors have made good use. The one point on which I find myself in disagreement with Drs. Diveley and Harrington is that in a compound fracture seen early the most dangerous organisms which are potential invaders are the gas bacillus group and the streptococci. Now sulfanilamide is very much more potent with those than sulfathiazole. I like to use sulfathiazole only when there is pretty good evidence that the staphylococci are the infecting organisms. I believe that it would be wiser to use sulfanilamide in the first thirty-six to forty-eight hours and then switch to staphylococcus specific and use the sulfathiazole group later. Certainly, in the case which they showed us in the movie which was ninety-six hours old the drug of choice would be sulfathiazole, because it was evident that there was not a gas infection and probably not a streptococcal infection in a wound that looked like that. The main point, however, is that here we have a series of drugs which have tremendous potentiality to help us. We must learn how to use them. We must learn how to couple them with surgical procedures. We are faced with the problem of the individual compound fracture in which the degree of bone damage, circulation, soft tissues, the duration of time since the accident occurred and the character of the ground introduce, one might say, a hundred different variables, and the point that I should like to end on is that, while we have powerful aids now which we have not had in the past, there is still no substitute for surgical judgment.

DR. REX L. DIVELEY, Kansas City, Mo.: There are many points that we hope to prove in the future. As Dr. Johnson has said, possibly sulfanilamide can be used more effectively as far as the prophylaxis against the streptococcus and gas bacillus are concerned. Dr. McKeever has mentioned puncture wounds. Small puncture wounds without a great deal of traumatism to the soft tissues I do not believe need to be disturbed. We, of course, sterilize the nozzle of the insufflator, and this can be introduced into the wound and powder can be thoroughly instilled into the wound without an extensive débridement. He mentioned abscesses which might appear later. Unquestionably we are going to have some kickbacks from this procedure. While our results are seemingly excellent at the moment in our particular series, the method is less than a year old. We shall know a lot more at the end of a few more years.

HEPARIN IN SUBACUTE BACTERIAL ENDOCARDITIS

REPORT OF CASES AND CRITICAL REVIEW OF LITERATURE

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AND

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CASE 1.—History.—Ann Arnholt, aged 19, an Ohio State University student, was admitted to the White Cross Hospital, Columbus, March 5, 1940. In October 1939 the present illness began with acute inflammation of the upper respiratory tract, fever, anemia, cessation of the menses, swollen joints and a mitral systolic murmur at the apex. The clinical diagnosis was acute vegetative endocarditis. Blood cultures were negative until November 16, at which time a long chain nonhemolytic streptococcus was obtained. Administration of sulfapyridine was discontinued owing to severe vomiting. In December and again in February 1940 she had a cerebral accident which on the first occasion partially paralyzed her right arm and on the second occasion the left arm and left side of the face. In March vision was blurred, acuity of hearing failed and headaches and urinary frequency developed. Repeated cultures through March 12 were reported as a short chain streptococcus. During the period from the onset, October 1939, to admission, March 5, 1940, she had lost 65 pounds (29.5 Kg.). On admission she was greatly dehydrated, weak, partially paralyzed in both arms and one leg, suffered headaches and was very nervous and fretful. The patient was brought to us because her parents had read of the treatment of bacterial endocarditis with heparin. The dangers of the treatment were carefully explained to the parents.

Clinical Course in Hospital.—The duration from admission to death was twenty-seven hospital days—March 5 to March 31 inclusive. During the first seven days measures were carried out to combat her general poor condition. Heparin was administered during the next fifteen days and no heparin was given the last five days. Sulfapyridine was given daily from the second to the twenty-fifth day in amounts shown on the chart (fig. 1); also charted are the fluid intake and urinary output. Sulfapyridine caused nausea and vomiting throughout. After the priming dose, heparin was administered through a needle inserted in the saphena-magna vein at the ankle; however, heparin was discontinued for three days from March 19 to March 22 because the needle assumed a position which impeded intake of the heparin and saline solution and to give the patient a rest from continuous drip therapy. The needle was then inserted in the vein of the other ankle.

The coagulation time was determined daily (method of Lee and White) at the same hour by the same technician. The normal coagulation time was four and five minutes on admission. Under heparin treatment the tests were reported as but six and one-half to seven and one-half minutes.

Mentally she improved considerably after the heparin administration was begun, and she maintained this apparent improvement until after the cessation of heparin treatment. In spite of the nausea caused by the sulfonamide drug, she ate and slept better, and the nurses who were with her twenty-four hours a day reported that she used her partially paralyzed limbs better than before. The heparin was stopped two or three days earlier than had been anticipated, owing to the sharp decrease in the urinary output, which occurred on the twenty-fourth hospital day (fig. 1). This was coincident with moderate generalized edema.

On the twenty-sixth hospital day—three full days after the cessation of heparin and the day before death—the patient seemed considerably improved, moved her left arm and leg and talked about going home. The morning of the twenty-seventh day severe edema of the face, hands and ankles developed. Her nails were cyanotic, respirations were shallow and labored, the pulse was weaker and the heart had a gallop rhythm. Oxygen was administered, but the patient lapsed into coma and died during the evening of the twenty-seventh day.

Dr. R. S. Fidler of the White Cross Hospital made the postmortem examination, which we witnessed. It revealed no thrombus either proximal or distal to the insertion of the needles used for heparin administration. The spleen was twice the normal size, contained numerous infarcts, old and recent, the largest of which were 2 cm. in diameter. The stomach and first part of the duodenum showed mucosal hemorrhages. Numerous old kidney infarcts were present, the largest 1 cm. in diameter, with no recent kidney infarcts. The abdominal and thoracic cavities and pericardium contained a large amount of straw colored fluid. The heart showed destruction of the aortic valve, as shown in figure 2. The arachnoid was found distended with a brownish fluid. There was brownish discoloration over the left parieto-occipital area, and an old hemorrhagic area at the middle portion of the right cerebral artery. The ventricles showed no pathologic changes, and no recently infarcted areas or emboli could be found. Microscopic sections showed the aortic cusp and the surface of the valve covered with a fibrinous thrombus beneath which there was some proliferation of endothelial cells. Within this superficial thrombus were colonies of bacteria. Beneath the endothelial layer was a productive fibrosis with a moderate infiltration of pus cells and lymphocytes. The blood vessels of the duodenum were engorged with blood but were not thrombotic. The final diagnosis was:

1. Acute and subacute vegetative bacterial endocarditis of the aortic valve invading the mitral valve.
2. Acute and subacute myocarditis.
3. Embolic infarcts of the middle cerebral artery, kidneys and spleen.
4. Subarachnoid edema with old hemorrhage.
5. Superficial mucosal hemorrhagic degeneration of the gastrointestinal tract.
6. Generalized edema of the subcutaneous tissues, ascites and pleural and pericardial effusion.
7. Infantile uterus with fibrosis and follicular cysts of the ovaries.

CASE 2.—History.—L. T., a woman aged 37, had onset of symptoms three months before her hospital admission, Nov. 2, 1939. Repeated blood cultures were positive for *Streptococcus viridans*. She was treated with sulfapyridine, which rendered the blood negative for a while.

Course in Hospital.—During her first twelve hospital days the temperature curve showed daily rises to 102 and 103 F., and she complained of occasional attacks of pain in her left shoulder. Two days later she received 500 cc. of whole citrated blood. On the nineteenth hospital day a continuous intravenous drip of 30,000 units of heparin in 1,500 cc. of physiologic solution of sodium chloride was started with the chemotherapy. During this procedure her temperature curve demonstrated a daily fluctuation (99 to 100 F.). In a few days she became

1. Dr. S. A. Hatfield gave the authors permission to report this case, which was under his care at the Ohio State University Hospital.

severely nauseated and demonstrated some edema of the ankles and of the right hand and arm. By the seventh day of heparin treatment her clotting time had increased to one hour and fifteen minutes. She complained of severe headaches and vomiting. Heparin therapy was discontinued and her temperature rose to 103 F. and she began voiding and defecating involuntarily. Her extremities became cold and she would not respond to any stimuli. Blood pressure rose to 178 systolic and 100 diastolic and caffeine and sodium benzoate were given; also daily clysis of 1,000 cc. of 5 per cent dextrose in physiologic solution of sodium chloride was administered. On the sixth day of coma she regained partial ability to speak, but a slight twitching of the left side of her face and of her left arm was noted. Speech gradually improved. During the course of the next month her temperature ranged between 100 and 103 F. She complained frequently of severe pain in her head, abdomen, shoulder, legs and arms. Culture of her blood became positive and her spleen palpable. On the eighty-first hospital day she complained of the sudden onset of a red and painful area over the dorsum of her left foot. Twenty days later she had severe headache

and Katz,³ first proposed the physiologically attractive theory of the use of heparin for this condition, states that he now believes it to be of no value. And Fletcher, after an experience with one case⁴ and a second case a year later,⁵ states that the use of heparin should be discontinued; finally Blumer⁶ writes that the method as used should be abandoned. However, improvement in cases reported by Kelson and White,⁷ as well as several cases reported by various authors which apparently showed improvement clinically while under treatment, has given some authors hope that further trial might be justifiable, and this view has been editorially supported wholly or in part.⁸

If Friedman, Hamburger and Katz's original theory is to be experimentally tested, we doubt whether the plan of heparin treatment used by them and followed by subsequent workers constitutes an adequate test of the theory. We doubt whether the entire plan of

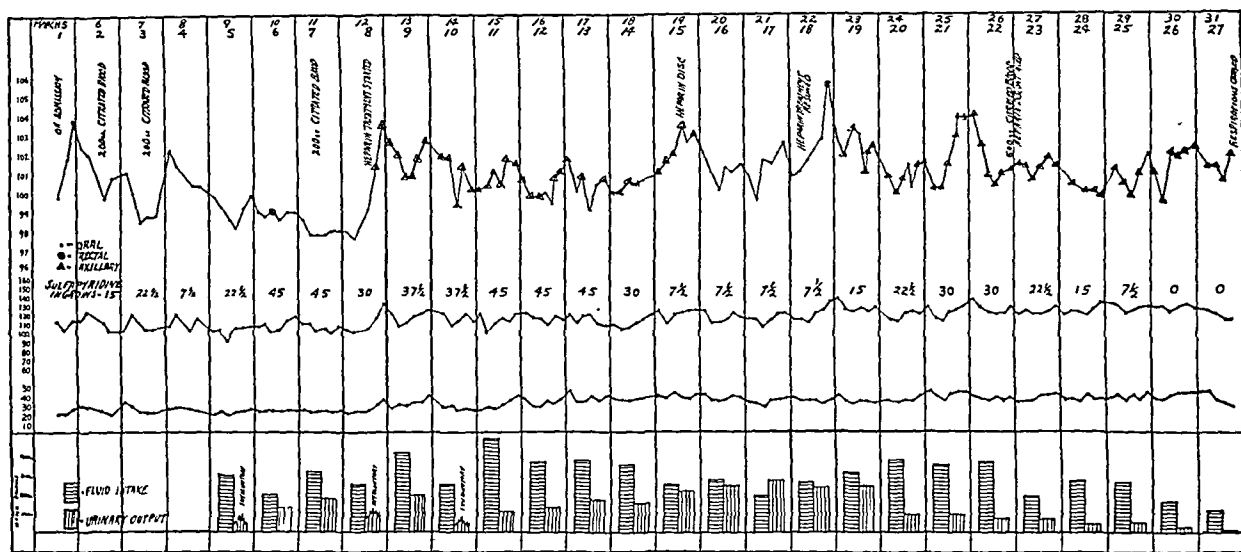


Fig. 1 (case 1).—Clinical observations from March 5 to March 31.

and a painful abdomen and again she voided involuntarily. On the following day spasmodic twitching of her left arm and an occasional attack of a convulsive seizure occurred. The temperature rose to 105 F. and her pulse became rapid and weak. Respirations were shallow and irregular. She exhibited extreme peripheral cyanosis, dyspnea and coldness. She died on her one hundred and first hospital day with the diagnosis of sub-acute bacterial endocarditis.

Dr. Emmerich von Haam made the autopsy report. This patient also had multiple infarcts of the spleen and kidneys and likewise involution of the ovaries and uterus, as well as old cerebral hemorrhage. In addition to the pathologic picture of valve damage, she showed recent meningeal hemorrhage as the cause of death.

CRITICAL REVIEW

We see no value in a computation of the percentage of improvements in this series. Certain cases would have to be deleted for various obvious reasons. The incidence of subarachnoid and cerebral hemorrhage is alarming. There is no reason to believe that other cases known to have been under treatment by this method, but which have not been reported in the literature, fared better. Friedman,² who with Hamburger

subjecting the patient to the effects of heparin, sulapyridine and a large quantity of fluid simultaneously—all within two weeks—is judicious.

We recognize the amount of heparin given and the duration of administration as the same which are used for the prevention of postoperative thrombosis. Crafoord⁹ has shown that in the same patients a greater heparin dosage is needed after operation to produce a given prolonged coagulation time than before operation; and Rojak¹⁰ in a series of 67 operative and non-operative cases has shown that in postoperative conditions additional heparin is required to attain a given

3. Friedman, Meyer; Hamburger, W. W., and Katz, L. N.: Use of Heparin in Subacute Bacterial Endocarditis, *J. A. M. A.* **113**: 1702-1703 (Nov. 4) 1939.
4. Fletcher, C. M.: Subacute Bacterial Endocarditis Treated with Sulfapyridine and Heparin, *Lancet* **2**: 512-514 (Oct. 26) 1940
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2. Friedmann, Meyer: Use of Sulfanilamide and Sulfapyridine in Therapy of Subacute Bacterial Endocarditis, Arch Int Med 67:921-938 (May) 1941.

Summary of Series of Sixty-Seven Cases of Subacute

No.	Author	Treated	Cases	Sex	Age	Duration of Disease	Blood Cultures	Heparin Used	Concentration
1	Friedman, Hamburger and Katz	March 1938	1	♂	..	Old	Str. viridans	Connaught	30 cc. per liter
2	Kelson and White.....	April 1939	1	♂	21	.....	Str. viridans	Connaught	30,000 units per liter
3	Kelson and White.....	April 1939	2	♂	22	2½ weeks	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
4	Kelson and White.....	April 1939	3	♀	23	6 months	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
5	Kelson and White.....	June 1939	4	♀	19	3 weeks	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
6	Kelson and White.....	July 1939	5	♂	41	7 weeks	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
7	Kelson and White.....	July 1939	6	♂	25	1 week	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
8	Kelson and White.....	July 1939	7	♂	41	7 months	Str. viridans	Connaught	10 cc. vial to 500 cc. saline
9	Witts, L. J.....	February 1940	1	♀	..	Advanced state	.....	Roche	15 mg. an hour; 300 mg. to liter; normal saline daily
10	Weeks, DeForrest.....	December 1939	1	♀	33	3 months ±	Positive?	.....	10 cc. vial to 500 cc. saline
11	Miller, E. R.....	April 1940	1	♀	11	1 year?	Str. viridans 190 per cc.	Connaught	10 cc. to 500 cc. saline (10,000 units)
12	Fletcher, C. M.....	December 1939	1	♂	..	6 weeks	159 colonies per cc. Str. viridans	A-B-C (see original)	12,500 to 15,000 units per 500 cc.
13	Fletcher, C. M.....	December 1940	2	♀	40	3 months	Str. viridans	Liquemin (heparin) Roche	1 mg. powder per cc. saline
14	Kleiber, E. E.....	January 1940	1	♀	19	1 month	30-200 colonies per cc.	Connaught	10 cc. per 500 cc. saline
15	Petch, C. P.....	.....	1	..	..	.....	Positive	.....	.....
16	Petch, C. P.....	.....	2	..	..	.....	Positive	.....	.....
17	Petch, C. P.....	.....	3	..	..	.....	Positive	.....	.....
18	Petch, C. P.....	.....	4	..	..	.....	Positive	.....	.....
19	Dockeray and Kawerau.....	.....	1	♀	19	Old	220 colonies per cc. Str. viridans	Liquemin (heparin) Roche	350 mg. powder to 1 liter of sodium dextrose
20	Doane, J. C.....	February 1940	1	♂	46	6 months	Str. viridans	Connaught	10 cc. vial (10,000 units) 500 cc. saline
21	Doane, J. C.....	February 1940	2	♀	31	4 weeks	40 per field Str. viridans	Connaught	10 cc. vial (10,000 units) 500 cc. saline
22	Doane, J. C.....	February 1940	3	♀	13	20 days	Str. viridans	Connaught	10 cc. vial (10,000 units) 500 cc. saline
23	Sevitt, S.....	July 1940	1	♂	28	3 weeks	.....	Liquemin (heparin) Roche	Saline
24	Sevitt, S.....	June 1940	2	♂	..	3 months	.....	Roche	4-16 mg. per hour in 1 liter daily
25	Friedman, M.....	.....	1	..	60	2½ months	Str. viridans	.....	.....
26	Friedman, M.....	.....	2	..	7½	2 months	Str. viridans	.....	.....
27	Friedman, M.....	.....	3	..	34	1½ months	Str. viridans	.....	.....
28	Druckman, J. S.....	December 1940	1	♀	31	.....	Str. viridans	.....	20 cc. per liter of distilled water
29	McLean, Meyer and Griffith	March 1940	1	♀	19	.....	Long chain Str. viridans	Connaught	20 cc. to 10,000 cc. saline
30	Personal communication... Case of Dr. S. A. Hatfield (Ohio State Univ. Hosp.)	December 1939	1	♀	37	3 months	Str. viridans	Connaught	20,000 units per 1,700 cc. saline
50	Kelson and White.....	20 cases	..	..	.....	.....	.....	.....	.....
54	Deitrick.....	4 cases	..	..	.....	.....	.....	.....	.....
67	Lichtman and Bierman... Jones, C. O.—Case apparently not treated with heparin	13 cases	..	..	.....	.....	.....	.....	.....

Bacterial Endocarditis Treated with Heparin

Rate, Drops per Minute	Total Heparin	Priming	Clotting Time	Duration of Heparin Treatment	Complications	Results	Autopsy	Cause of Death
.....	.....	.....	5 × normal (30 min.)	10 days	Nephritis; projectile vomiting	Died on 10th day of treatment	Yes	Cerebral hemorrhage
15-25	.....	.....	About 1 hour	3 days	Severe recurrent pulmonary infarction	Died two weeks after treatment		
15-25	260 cc.	.....	About 1 hour	14 days	Concurrent rheumatic fever	Well 19 weeks; died Oct. 12, 1939	Yes; healed lesions	Congestive failure but healed endocarditis
15-25	290 cc.	.....	About 1 hour	14 hours		Well 18 weeks		
15-25	.....	.....	About 1 hour	40 hours +	Headache, vertigo, amblyopia	Chills and fever, died	Yes	Large occipital and subdural hematomas
15-25	.....	.....	About 1 hour	1½ hours	Chills, high fever, collapse (heparin toxicity)	Died 17 hours after heparin therapy	Yes; typical lesions	Heparin toxicity?
15-25	.....	.....	About 1 hour	1½ hours	Chills and fever (heparin toxicity)	No change		
15-25	185 cc. +	.....	About 1 hour	1 hour + 7½ days	Chills and fever (heparin toxicity)	No evidence of disease 4 weeks after treatment		
.....	.....	.....	About 1 hour	7 days	Renal hemorrhage; heparin discontinued for 12 days on 3d day	Grew worse under treatment; died on 7th day of treatment	Yes; usual features of endocarditis	Subarachnoid hemorrhage
20	.....	.....	12½ to 45 min.	11 days 1st course; 2d summer of 1940 *	No hemorrhages, September 1940 to September 1941	Improved; living; still in bed with temperature 99.2		
15-25	401,600 units 20,000 cc. 2% solution	.....	4 min. to 4 hrs. 25 min.	10 days	Hematemesis and bleeding from gums on 4th day	Died suddenly on 10th day of treatment	Yes, involved valve; Str. viridans in blood	Cerebral hemorrhage
20,000 units in 24 hours; 20-40	.....	.....	.....	4 days plus 4 days more	Venous thrombosis; heparin of varied strength; headache; nausea	Died on 4th day of second course	Yes	Cerebral hemorrhage
1 liter daily	130.8 mg. in 12 days 90 cc.	.....	8¼ to 77 min.	12 days	Headache; vision defect	Died 6 hours after heparin stopped	Yes; vegetations not affected	Cerebral hemorrhage
.....	900,000 units	.....	.....	Estimated 4 to 5 days	Gross hematuria toxic to heparin	Cerebral hemorrhage about 6 days after heparin; died 6 months later	Yes; some evidence of healing lesions	Right hemiplegia
.....	.....	.....	.....	.....	Variation in heparin strength	Well for 6 months		
.....	.....	.....	.....	.....	Variation in heparin strength	Died		Intracranial hemorrhage
.....	.....	.....	.....	.....	Variation in heparin strength	Died		Intracranial hemorrhage
.....	.....	.....	.....	.....	Variation in heparin strength	Died		Toxic jaundice
(Also rotary pump) 15-18	1,867 mg. or 5,335 cc. of solution used	40 mg. in 5 cc.	70 to 130 min.	8 days	None; improvement striking	Lived 3 months after treatment	Yes, endocarditis; kidney infarcts	Disease
15-35	.....	.....	5 times normal	8 days	On 7th day of heparin, nystagmus; unconscious on 8th day	Dead on 8th day	Yes, liver and spleen infarcts	Cerebral hemorrhage
15-35	23 vials 250,000 units	.....	5 times normal	14 days		Alive and undertaking second course of heparin, 300,000 units plus		
15-35	.....	.....	5 times normal	14 days		Well; discharged from hospital April 1, 1941		
16; 42 cc. per hour 1½ liter daily	.....	.....	15-20 mg. heparin more than trebled clotting time	2 or 3 days	Pulmonary embolism	Dead on 3d day	Yes	Embolus, right pulmonary artery
16; 42 cc. per hour 1½ liter daily	.....	.....	10 min. to 5 hours	72 to 80 hours	Air hunger; coma	Died during treatment	Yes, splenic infarcts; brain softening; no hemorrhage	Cerebral embolus
.....	3-4 vials daily for 35 days	.....	15-35 min.	35 days		Dead	Yes	
.....	3-4 vials daily for 21 days	.....	15-35 min.	21 days	Thrombosis in vein used to administer heparin	Dead		
.....	3-4 vials daily for 14 days	.....	15-35 min.	14 days		Dead	Yes	
.....	.....	.....	Varied from 15-235 min.	10 days +	Heparin (toxicity?)	Well		
20-40	340,000 units	Yes; 10,000 units	4 to 7½ min.	12 days	Edema; cerebral embolus	Dead	Yes	Disease
.....	.....	.....	3 to 75 min.	7 days	Cerebral hemorrhage; edema-coma; paralysis; edema; treatment discontinued on 7th day	Died in hospital on 101st day about 2 months after therapy	Yes	Disease
.....	.....	.....	.....	.....	.....	2 cases improved; 15 cases not improved		
.....	.....	.....	.....	.....	.....	No recoveries		
.....	.....	.....	.....	.....	.....	1 recovered; 12 did not recover		

prolongation of the coagulation time. The amount of heparin used in treating postoperative thrombosis is based not only on the necessity of maintaining the blood at a higher incoagulable level but also on the necessity of neutralizing the thromboplastic substance (cephalin) which is freed in the course of an operation. The neutralizing action of cephalin and heparin on each other almost prevented the discovery of this anticoagulant.¹¹ This free cephalin does not exist as such in bacterial endocarditis, and therefore an amount of heparin to neutralize it is not required.

Further, the overdosage of heparin may be just the additional amount required to cause untoward complications such as those reported by Kleiber¹² and Witts,¹³ namely more or less renal hemorrhage. This may occur even in massive quantity, as was reported recently.¹⁴

While an extremely prolonged coagulation time of one to five hours, which has been produced by this amount of heparin, may not in itself be dangerous, apparently the effects of the extreme fluidity of the blood produced by this dosage has been overlooked.



Fig. 2 (case 1).—Destruction of aortic valve. Vegetations may easily become emboli.

In a patient who may have vegetations suspended by a fibrin thread in a heart whipped to feverish activity, this excessive fluidity may cause emboli by the mechanical factors present and produced. Even the earliest (1916) preparations of cuorin and heparphosphatid¹⁵ produced such fluidity. Since emboli developed in so many cases while under treatment or shortly thereafter, the amount of heparin used and the fluidity of the blood occasioned by it appear to be the probable precipitating causes. A dosage based in part on body weight should be considered.

The duration—two weeks—has proved adequate to prevent postoperative thrombosis, but we doubt whether the healing required in the vegetations could be accomplished within this period; on the other hand, heparin

given by continuous intravenous drip could not be tolerated longer by these very sick patients.

It is questionable whether the amount of fluid administered as heparin solvent is not immoderate in a patient with a badly damaged heart, and possibly, if not probably, with diminished kidney function due to preexisting infarcts. The amount of fluid used and the concentration of the heparin are essentially the same as those used in prevention of postoperative thrombosis; however, in these cases the heart is presumably normal and the fluid itself has a definite value. Added to this is the fact that continuous intravenous injections by the drip method are extremely difficult to regulate for uniform delivery of either the medium or the solvent.¹⁶ However, an efficient control of such a slow and prolonged procedure was obtained by the use of the rotary pump.¹⁷ Certainly if the intravenous drip method is to be used the fluid intake and the urinary output should be carefully charted.

In Sweden very good results have been obtained by single intravenous injections of heparin every six hours, although Rojak's work would indicate that a more uniform incoagulability of the blood could be maintained by injections every four hours. This would obviate the necessity of administering so much fluid and probably be adequate for the purpose to be accomplished in treating bacterial endocarditis. It would also eliminate much nursing expense. Murphy, Correll and Grill¹⁸ have recently pointed out the dangers of intravenous solutions. The single injection method, however, has the disadvantage of rapid elimination of heparin from the blood stream. If the continuous injection method is to be continued, the pump should be used and the amount of heparin and fluid reduced.

The question of the simultaneous use of heparin and a sulfonamide drug also arises; for the vomiting which is a frequent untoward effect of sulfapyridine may cause a further strain on the heart and thus contribute to the mechanical effects causing emboli. Some work has been done by N. A. David and his associates¹⁹ to reduce the various untoward effects of the drug. Swain's²⁰ recommendations for in vitro tests of the organism's susceptibility to the sulfonamide drug should be carried out if its use is to be continued. However, if Friedman, Hamburger and Katz's original theory is to be tested, we believe that, since the blood is known to possess a high titer of antibodies for the organisms and since the main problem is not the sterilization of the blood stream, heparin should be allowed to act alone in preventing further valve deposits and permitting old ones to heal. This should be tested without complicating the picture by the simultaneous use of sulfapyridine. The fluidity of the blood caused by heparin, even in moderate dosage, may increase the amount of antibodies present in the relatively avascular valves.

Selection of cases in this series does not seem to have taken place. Apparently the cases were accepted as they became available. A summary of 67 cases is

11. McLean, Jay: The Thromboplastic Action of Cephalin, *Am. J. Physiol.* **41**: 250-257 (Aug.) 1916.

12. Kleiber, Estelle E.: Subacute Bacterial Endocarditis Treated Unsuccessfully with Sulfapyridine and Heparin, *J. A. M. A.* **115**: 1713-1714 (Nov. 16) 1940.

13. Witts, L. J.: Heparin in Subacute Bacterial Endocarditis, *Brit. M. J.* **1**: 484 (March 23) 1940.

14. Ersbiler, I. L., and Blaisdell, I. H.: Massive Hematuria Following Use of Heparin in Cavernous Sinus Thrombosis, *J. A. M. A.* **117**: 927-930 (Sept. 13) 1941.

15. Cuorin and heparphosphatid were renamed antiprothrombin (Howell, W. H.: The Coagulation of Blood: Harvey Lecture 1916-1917 Series, 273-324, April 7, 1917) and antiprothrombin was renamed heparin (Howell, W. H., and Holt, E.: Two New Factors in Blood Coagulation, Heparin and Preantithrombin, *Am. J. Physiol.* **47**: 323-341 [Dec.] 1918).

16. Seivitt, S.: Treatment of Bacterial Endocarditis with Heparin and Sulfapyridine, *Lancet* **1**: 443-444 (April 5) 1941.

17. Dockeray, G. C., and Kawerau, Einhart: Heparin in Subacute Bacterial Endocarditis, *Brit. M. J.* **2**: 703 (Nov. 23) 1940.

18. Murphy, F. D.; Correll, Howard, and Grill, J. C.: The Effects of Intravenous Solutions on Patients With and Without Cardiovascular Defects, *J. A. M. A.* **116**: 144-148 (Jan. 11) 1941.

19. David, N. A.; Phatak, N. M.; Donnell, H., and Vehrs, H.: Intravenous Toxicity of Heparin-Sodium Sulfapyridine Combinations and Protective Action of Barbiturates, *J. Am. Pharm. A.* **30**: 32-40 (Feb.) 1941.

20. Swain, R. H. A.: Strain Variations in the Resistance of *Streptococcus Viridans* to Sulfonamide Compounds, *Brit. M. J.* **1**: 722-725 (May 4) 1940.

given in the accompanying table.²¹ While it is difficult to determine just what is an old or a recent subacute bacterial endocarditis (the basis of a damaged heart may have originated in childhood), still we believe that a patient such as ours who was almost moribund on admission is not suitable for the treatment unless the plan of treatment in the future is radically altered.

CONCLUSIONS

1. The results secured in this series of 67 cases do not warrant further trial of the treatment by heparin according to the plan used.

2. If heparin treatment is to be continued, we believe that the various factors which must be considered before treatment is given, as well as be controlled during treatment, will require the cooperation and facilities afforded by a group of scientists working in an institute for medical research which could admit an adequate number of selected cases for a suitable duration.

247 East State Street.

HIGH VOLTAGE ROENTGEN TREATMENT OF ELUSIVE ULCER OF THE BLADDER

A REPORT OF A CLINICAL STUDY OF
TWENTY-FIVE CASES

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AND

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This paper is based on a clinical study of 25 patients given high voltage roentgen therapy in whom the diagnosis of elusive ulcer was made. The various forms of treatment that have been advised and employed, from wide resection of the ulcer-bearing area to fulguration, are legend and it is not necessary to review them at this time. Suffice it to say that when the treatment of elusive ulcer is discussed and all the various forms of treatment are mentioned, the use of roentgen rays is mentioned as casually as are some of the other forms of treatment. So far as we know, a study of a group of similar cases treated with high voltage roentgen therapy has not been reported.

Because of the paucity of reports of the results of treating elusive ulcer with high voltage roentgen rays, and because of the present trend to treat inflammatory conditions elsewhere in the body with roentgen rays, it occurred to us to treat a series of patients to determine whether or not roentgen therapy is of any value in elusive ulcer.

The 25 patients were studied in two separate groups: The first group, consisting of 10 women, were studied

in 1932 and 1933, and the second group, consisting of 12 women and 3 men, were treated in 1938 and 1939.

In order to avoid producing an artificial menopause with its distressing symptoms, the women selected had all reached the menopause. The first group of patients received fulguration and water dilation along with roentgen therapy. The specific factors used were as follows: Four fields, 15 by 15 cm., two anterior and two posterior, were treated daily with 140 kilovolts, 5 milliamperes, 25 cm. target skin distance, 0.25 mm. of copper and 1 mm. of aluminum filter, one area being given 200 roentgens daily, with a total dose of 600 roentgens to each area with each course of treatment. The total dose to the pelvis was 2,400 roentgens. This course was repeated two to four times at six week intervals, depending on the patient's local and systemic reactions.

All the patients had an increase in their bladder symptoms during the course of treatment which persisted for about two weeks. Following this there was some temporary improvement in about 50 per cent of the patients, and 2 patients were definitely improved. The remaining 8 patients had no permanent improvement.

Because of the improvement noted in these 2 cases it was decided to study a second group of cases in which roentgen therapy only was used after other forms of treatment had failed. The specific factors used in this group were as follows: Two fields of 15 cm., one anterior and one posterior. The following physical factors were used: 200 kilovolts, 10 milliamperes, 0.5 mm. of copper, 1 mm. of aluminum filter and 50 cm. target skin distance, delivering 200 roentgens daily to alternate portals; 600 roentgens was given to each area in each course of treatment. The total dose to the pelvis was 1,200 roentgens. Two or three courses of treatments were given to these patients at six week intervals.

During the course of treatment these patients experienced a definite increase in their bladder symptoms which continued for about two weeks after treatment. Again some temporary relief was noted in half of the patients. Follow-up cystoscopies and clinical observations failed to disclose a single case of permanent relief by roentgen therapy.

This group of cases was closely followed by repeated cystoscopies, and while here and there there seemed to be an activation of the process for the time being, in that there appeared to be a little more redness in the ulcer-bearing area at the end of the treatment, whatever local reaction may have occurred soon disappeared and so far as one could tell from cystoscopy there was no change in the character of the ulcer-bearing area. In no case was the patient any worse after the treatment than before.

SUMMARY

Roentgen therapy as we administered it in this group of cases failed to effect a permanent cure in a single case. During the treatment there was an acute exacerbation of the bladder symptoms, which disappeared, followed by some relief of the symptoms. This relief was transitory in all cases. Our experience, therefore, in treating a well selected group of elusive ulcers which were not benefited by previous treatment and in which only roentgen therapy was given verifies the general impression that high voltage roentgen therapy is of little value in the treatment of elusive ulcer.

122 South Michigan Avenue.

21. Authors referred to in the table but not in the text include:

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From the Presbyterian Hospital of Chicago.

Read before the Chicago Urological Society, Nov. 28, 1940.

Clinical Notes, Suggestions and New Instruments

HODGKIN'S DISEASE OF THE HEART AND PERICARDIUM

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Murchison¹ was the first to describe involvement of the heart in Hodgkin's disease. The condition is rare, as indicated by recent reviews of the literature.²

This communication reports a case of Hodgkin's disease in which the appearance of symptoms of myocardial insufficiency led to a clinical diagnosis of cardiac involvement. The administration of high voltage roentgen therapy seemed to cause temporary improvement.

REPORT OF CASE

B. U., a white woman aged 27, entered the Cleveland City Hospital on Dec. 21, 1929. She had had enlarged cervical lymph nodes for one month. A biopsy revealed Hodgkin's disease. During the following years high voltage roentgen therapy was administered periodically to the neck, axillas, groins and trunk for involvement of the lymph nodes in these regions.

In 1935 she was in good enough health to have an operation for appendicitis and three months later one for chronic cholecystitis and cholelithiasis.

In January 1938 she began to be short of breath and to cough. A film of the chest, Jan. 12, 1938, showed enlargement of the mediastinal nodes and considerable infiltration of the upper lobe of the left lung, presumably due to Hodgkin's disease. The transverse diameter of the cardiac shadow was 14 cm. as compared to 11 cm. in previous films.

The patient received roentgen therapy³ to the upper left portion of the chest anteriorly and posteriorly in 100 r fractions daily for twenty days, starting January 19. Films of the chest taken January 31 and February 15 showed progressive diminution in the parenchymal involvement, and the patient felt better. The transverse diameter of the heart remained the same.

Shortness of breath recurred and a film of the chest on August 3 showed the cardiac shadow to be further enlarged, measuring 16.5 cm. in its transverse diameter (in relation to the greatest internal thoracic diameter of 29 cm.). The upper lobe of the left lung showed streaked mottling, presumably due to fibrous healing.

Because the shortness of breath became worse, the patient was admitted to the hospital November 3. She was given high voltage roentgen treatments to the upper anterior and posterior portions of the mediastinum in 200 r doses on ten successive days, starting November 14. She was discharged November 30, her condition being improved. Films showed that the transverse diameter of the cardiac shadow had decreased to 14 cm.

The dyspnea returned, however, and edema of the legs appeared. When admitted to the hospital Jan. 2, 1939, she presented the picture of heart failure. She was orthopneic, the legs were edematous, the liver was enlarged and tender and there was fluid in both pleural spaces. The heart was enlarged and showed a gallop rhythm but no significant murmurs. The blood pressure was 100 systolic and 70 diastolic. On the eleventh hospital day the cardiac mechanism was auricular fibrillation.

An electrocardiogram, January 4, showed tachycardia of unknown origin, low voltage of the QRS and T waves in all leads and an inverted T wave in lead 2. One taken January 11

showed auricular fibrillation, low voltage of the QRS and T waves in all leads and an inverted T wave in lead 2. The serum albumin was 3.5 Gm. per hundred cubic centimeters of blood and the globulin 2.3 Gm. per hundred cubic centimeters. A film of the chest, January 5, showed the mediastinal and cardiac shadows to be unchanged.

Rest in bed, digitalis, aspiration of the pleural effusions and symptomatic treatment brought about moderate improvement. The enlarged cardiac shadow, the myocardial insufficiency, the auricular fibrillation and the abnormal electrocardiogram were now ascribed to involvement of the heart by Hodgkin's disease. The patient was discharged January 30.

A recurrence of the symptoms and signs of myocardial insufficiency caused her readmission to the hospital March 2. The cardiac mechanism at this time was normal. A film of the chest showed infiltration in the right hilus region and the upper half of the right lung. The infiltration in the hilus region made it impossible to measure the width of the cardiac shadow. The patient was given high voltage roentgen therapy to the upper half of the mediastinum anteriorly in 200 r doses on alternate days for four treatments, from April 18 to April 24. She also received digitalis and mercurial diuretics. She was discharged April 29, her condition being improved.

The patient was in the hospital again from June 6 to June 10. Her general condition was slightly improved. The cardiac mechanism was normal. The mottling in the right lung field had diminished. The transverse diameter of the cardiac shadow had further decreased, measuring 13 cm. There was evidence of only slight myocardial insufficiency.

She returned to the hospital on August 7 and stayed until September 3, at this time receiving roentgen therapy for enlarged abdominal lymph nodes. There was no evidence of heart failure.

During the next nine months, although her condition was poor, she was well enough to be cared for in the outpatient clinic, where periodically she received an injection of a mercurial diuretic.

June 10, 1940 she was admitted to the hospital in a moribund condition, emaciated, semistuporous and orthopneic. The cardiac mechanism was normal. The legs were edematous. She died fifteen hours later.

The clinical diagnosis was Hodgkin's disease with involvement of the lungs, mediastinum and heart and chronic myocardial insufficiency.

AUTOPSY

Autopsy was performed by Dr. A. E. Margulis seven hours after death. The body was normally developed and poorly nourished. Except for pallor of the skin and mucous membranes and pitting edema of the extremities, the external examination was negative.

The base of the heart, the aorta, the pulmonary artery and veins and the venae cavae were encased in a dense tumorous mass which filled most of the mediastinum and extended into both lungs. This tissue was dense and cut with definite resistance. The sectioned surface was gray and uneven, with slightly raised opaque areas intermingled with depressed, somewhat translucent areas. The lumens of the great vessels were not occluded or invaded, although they were compressed more or less and it was impossible to trace the venae cavae completely.

The mediastinal mass had extensively invaded the atrial walls, particularly that of the right atrium. Near the opening of the inferior vena cava the tumor tissue extended through the atrial wall and appeared as an irregular polypoid mass in the right atrial cavity. The uninvolved portions of the heart were normal. The pericardial space over the atria was obliterated—otherwise it was normal.

The right lung was more or less completely infiltrated with tissue similar to and continuous with the mediastinal tissue. The left lung was uninvolved except in the hilus region. There was a single subpleural nodule measuring 1 cm. in diameter and located in the upper lobe.

In the retroperitoneal area encasing the aorta and the inferior vena cava there was a large dense ovoid mass of tumor tissue measuring 8 by 8 by 15 cm. and extending from the diaphragm

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2. Harrell, G. T.: Hodgkin's Disease with Invasion of Pericardium and Gallbladder: Review of Literature and Report of Case with Autopsy, *Arch. Path.* 28: 58-64 (July) 1939. Ritvo, Max: Hodgkin's Disease: Report of a Case with Unusual Longevity and Invasion of the Heart and Pericardium, *New England J. Med.* 223: 891-895 (Nov. 28) 1940.

3. The factors utilized in the high voltage roentgen therapy were 200 kilovolts, 20 milliamperes and 0.75 mm. of copper plus 2.0 mm. aluminum filtration. The target-skin distance varied between 50, 60 and 70 cm. The size of the ports varied from approximately 50 to 150 square centimeters.

to the second lumbar vertebra. This tissue had destroyed the left adrenal and had invaded the capsule of the liver at one point.

The spleen was moderately enlarged, being the seat of tumor involvement and chronic passive hyperemia. The other viscera showed chronic passive hyperemia. No lymphadenopathy was discovered.

Microscopically the tumor tissue had all the histologic features of Hodgkin's granuloma. Sections from the base of the heart showed extensive involvement and destruction by this tissue of the parietal and visceral pericardium, and to a lesser extent of the myocardium. The uninvolved myocardium was normal.

The spleen and right lung showed considerable Hodgkin's tissue and chronic passive hyperemia.

The diagnosis was Hodgkin's disease with involvement of mediastinum, lungs, great vascular trunks, pericardium, heart, spleen, retroperitoneum, left adrenal and capsule of the liver.

COMMENT

The rarity of involvement of the heart or pericardium in Hodgkin's disease has been mentioned. This appears to be the first reported instance in which this condition has been diagnosed in life. In a previous study,⁴ the development of congestive failure without apparent cause in a patient with a malignant neoplastic disease was found to be the most important clinical finding pointing to cardiac metastases. Such a condition was present in this patient and, together with the auricular fibrillation, the enlargement of the cardiac shadow by roentgenogram and the pathologic electrocardiogram made the clinical diagnosis of involvement of the heart likely.

This is the second reported instance in which high voltage roentgen therapy has been used in the treatment of involvement of the heart by a tumor. Shelburne and Aronson⁵ have described a patient who suffered from a malignant tumor which had invaded the pericardium and septum of the heart and which was treated with high voltage roentgen therapy. There was strong evidence that the tumor was largely destroyed and that the function of the heart was not impaired by the treatment. An autopsy was not done.

In the case here reported, there also is evidence that the high voltage roentgen therapy was beneficial. There always was subjective and objective improvement following roentgen therapy. Furthermore, the patient lived in a fair degree of comfort for about one and a half years after myocardial insufficiency due to cardiac involvement had appeared. This is contrary to the usual experience, for the refractory character of the decompensation in tumors of the heart has been stressed by many observers.⁶ The fact that the auricular fibrillation was not permanent may have been due to the effects of the irradiation, although this cannot be proved.

The total length of this patient's illness deserves mention. Jackson⁷ concluded that on an average the patient with Hodgkin's granuloma lasts about two and a half years, 75 per cent die within three years and very few survive more than ten years. This patient lived ten and a half years from the time of the original biopsy.

SUMMARY

The development of congestive failure without apparent cause in a patient known to have Hodgkin's disease led to a clinical diagnosis of involvement of the heart. High voltage roentgen therapy seemed to cause improvement, the patient living in a fair degree of comfort for one and a half years after the first appearance of decompensation. Postmortem examination showed extensive involvement of both atria by Hodgkin's granuloma. The heart was normal otherwise.

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6. Lisa, J. R.; Hirschhorn, Louis, and Hart, C. A.: Tumors of the Heart: Report of Four Cases and Review of Literature. *Arch. Int. Med.* 67: 91-113 (Jan.) 1941.

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LYMPHOGRANULOMA VENEREUM OF THE HYPOPHARYNX AND LARYNX

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Lymphogranuloma venereum is a systemic venereal disease caused by a filtrable virus and having an incubation period of from three to thirty days. It is characterized by a chronic granulomatous lesion which is generally confined to the anorectogenital region. Occasionally it is found in other parts of the body but rarely in the pharynx or larynx. Lymphogranuloma venereum must be differentiated from granuloma inguinale. The latter begins as an infection of the skin and subcutaneous tissues in which Donovan bodies can be demonstrated and is found almost exclusively in Negroes. On the other hand, lymphogranuloma venereum does not originate in the same structures and is not confined to Negroes.

Buboes of venereal nature were known centuries ago, but it was not until 1913 that Durand, Nicolas and Favre¹ demonstrated that the disease causing them was transmitted through sexual intercourse. Hellerström² stated that the description given by Greek, Roman and Arabian physicians of some



Fig. 1.—Distribution of lymphogranuloma venereum on the soft palate and pharynx.

buboes coincided with that of lymphogranuloma venereum. It was well described by Chassaignac³ in 1859. A dermal sensitization test which bears his name was elaborated by Frei⁴ in 1925. The increase in travel facilities in recent years has played a major part in the introduction and spread of this condition to practically all parts of the United States.

The course of lymphogranuloma venereum seems to depend on the site of inoculation; it follows an acute, subacute or chronic course. The virus exists in human beings as long as the local lesion is present. The primary lesion usually occurs on the external genitalia but may be found on the surface of the skin or in the mouth, throat, rectum or eye. The first manifestation is a small ulceration or herpes-like vesicles on the genitalia. These usually heal in about five days; two or three weeks later, however, the regional lymphatics become involved. This adenitis may subside but usually continues as a low grade process. The glands become matted

Read before the American Laryngological Association in June 1941.

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2. Hellerström, S.: A Contribution to the Knowledge of Lymphogranuloma Inguinale. *Acta dermat.-venereol.*, supp. 1, 1929, pp. 5-224.

3. Chassaignac, C. M. E.: *Traité pratique de la suppuration et du drainage chirurgical*, Paris, V. Masson, 1859, p. 354.

4. Frei, Wilhelm: Eine neue Hautreaktion bei Lymphogranuloma Inguinale. *Berl. klin. Wchnschr.* 4: 2148 (Nov.) 1925.

together and may undergo disintegration. At first the skin becomes fixed; this is followed by tissue necrosis, from which fistulas result. The rectum is usually involved late in the course of this disease and becomes strictured as a result of healing. Metastatic lesions may develop at distant points.

When examined microscopically, the tissues display superficial necrosis superimposed on a base of granulation tissue. Epithelioid cells exist in large numbers; plasma cells, monocytes, eosinophilic and neutrophilic polymorphonuclear leukocytes, endothelial cells and occasional giant cells are found in a fibrinous mesh. Sections of glands disclose multiple minute punctate abscesses with peripheral piling up of endothelial cells and reticular cells and an occasional giant cell. The microscopic picture is not easily distinguished from that of syphilis or tuberculosis.

The progress of the disease is usually insidious. Such symptoms as general malaise, headache, anorexia, fever, chills and sweats and local pain are associated with the regional adenitis. The Frei test is positive for from ten to twenty-one days after the appearance of the enlarged glands. The Kahn test may be positive during the early stages but becomes negative. There are cases, however, in which periods of quiescence are followed by periods of renewed activity. The course of the disease in the mouth and pharynx is slow and stubborn, although some cases have been known to clear without even being recognized.

Very few cases involving the pharynx, and practically none affecting the larynx, have been recorded. Lymphogranuloma venereum of the tongue, however, is not uncommon. In the pharynx the disease must be differentiated from other chronic granulomas, such as those caused by syphilis, tuberculosis and fungous infections. The Frei test is the most dependable diagnostic criterion; next in importance is the increased protein content of the blood.

Metastatic lesions may occur in the brain, heart, muscles and other soft tissues, causing symptoms peculiar to the structures involved. About 30 per cent of patients recover from lymphogranuloma venereum without treatment. The disease may last a long time.

Apparently there is no form of therapy that is consistently effective. Brilliant results have been reported after the use of roentgen therapy and drugs of the sulfonamide group. Recently, Kornblith⁵ has reported striking results from the use of sulfthiazole and Frei antigen intravenously.

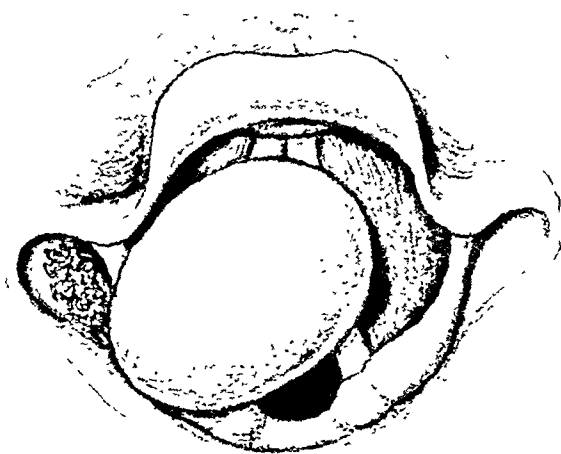


Fig. 2.—Distribution of lymphogranuloma venereum in the hypopharynx and larynx. Note edematous mass resembling a cyst.

REPORT OF CASE

An American-born Negro woman aged 31, admitted to the service of Dr. Matthew Golden at the Kings County Hospital on Oct. 14, 1940, complained of soreness in the right side

of the throat which had lasted for six months. Her local disease had begun one year before admission, at which time she experienced discomfort in the back of the right side of the nose, and a feeling of fullness in the adjacent ear. She recalled that three months after the onset of her illness she



Fig. 3.—Granuloma characterized by polyblasts, small round cells, plasma cells and reticuloendothelial cells from section of the pharynx. Giant cells are present.

had felt tired and weak and had lost 5 pounds (2,268 Gm.). At the same time she had felt a soreness and swelling of both sides of the upper part of the neck in the region of the angle of the mandible. Her temperature remained about 101 F. She consulted a physician who advised tonsillectomy, which was performed under local anesthesia in December 1939.

All local symptoms disappeared for three months, after which time they returned and persisted until recently. In addition, there have been occasional night sweats, expectoration of blood-tinged sputum and paroxysms of nonproductive cough. Pain has never been a prominent symptom and the patient has never experienced dysphagia. At one time her speech was slightly guttural. She could furnish no information concerning the manner in which the lesion originated. Her medical history was otherwise irrelevant.

Physical examination revealed nothing of significance except the local disease. On the right side the lesion included the tonsillar fossa and pillars, the soft palate, the lateral pharyngeal wall, the nasopharynx, hypopharynx and larynx. In the soft palate it extended as a narrow ribbon along the base of the uvula to the arch of the tonsillar fossa of the other side. The disease process consisted of a diffuse, irregularly distributed superficial, smooth ulcerogranuloma. The entire area was irregularly covered by a thin, film-like, milky exudate. On palpation, the involved structures were firm; they did not bleed readily.

The laryngeal mirror disclosed the same type of lesion in the hypopharynx; in the larynx, however, it was somewhat different. Originating from the aryepiglottic fold, there was a pale, grayish, smooth, firm, cystlike mass about the size of a pecan. It was movable and filled the brim of the larynx.

5. Kornblith, B. A.: Lymphogranuloma Venereum Treatment, in Blumer's Practitioner's Manual, Philadelphia, J. B. Lippincott Company, 1940, chapter 44, p. 511.

so that a view of the vocal cords was obscured. It was pulled into the glottis during forceful inspiration. The cyst-like mass was removed by snare during direct laryngoscopic exposure; it was found to have originated from the posterior border of the aryepiglottic fold. The fold remained as a firm, swollen, grayish structure. The larynx was otherwise uninvolved.

The patient was studied for evidences of syphilis and tuberculosis and, found to be free of them. Her blood cells were normal as to type and number, with the exception of the red cells, which numbered 3,600,000 per cubic millimeter. The Frei test gave a strongly positive reaction. The total protein content of her blood had increased to 9.2 mg. per hundred cubic centimeters and the albumin-globulin ratio was reversed. There was no evidence of active or healed rectal disease such as exists in most cases of lymphogranuloma venereum. Biopsy was performed on the pharyngeal and laryngeal lesions and reported by Dr. W. W. Hala, pathologist to the Kings County Hospital as follows: "Microscopic examination discloses a section consisting peripherally of an epidermoid type of mucosa and beneath is a submucosa, the site of a more or less diffuse granulomatous inflammation. Incorporated in the deeper zones is an area of mucous glands and a small piece of cartilage. The granulomatous lesion is characterized by an intense invasion, particularly by polyblasts, and included among these are small round plasma and larger reticuloendothelial cells.

"There are some areas just beneath the mucosa which appear to be milary pseudotubercles. Throughout the submucosa is a more or less hyaline-like stroma and many of the capillaries are filled with hyaline thrombi. In one of the sections there are typical giant cells simulating the Langhans giant cells of tuberculosis. There are practically no caseous areas, although in some of the hyaline stroma heretofore spoken of the tissue appears to be undergoing necrosis.

"In general, the histologic picture suggests so-called lymphogranuloma venereum."

Roentgen therapy was given without benefit. During six months of observation the lesions seemed to have penetrated slightly beyond the surface.

Treatment with Frei antigen was administered as follows: 0.3 cc. was injected intravenously every three days for two weeks; this was followed by a period of two weeks during which no treatment was given. Three such courses were given.

Recent examination revealed that the soft palate and adjacent structures which were previously tough, firm and ulcerated were now soft and epithelized. The tonsillar pillars, except for the right posterior, which was absent, and the piriform fossa appeared healthy. The larynx presented a healthy, slightly thickened mucosa, especially in the region of the right arytenoid process and its corresponding aryepiglottic fold, where a firm grayish lesion had previously existed.

136 East Sixty-Fourth Street.

ALLERGIC DERMATITIS FOLLOWING EXPOSURE TO TEAR GAS (CHLORACETOPHENONE, CN)

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AND

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While we were attending the fourth refresher course (April 1941) at the Medical Field Service School, Carlisle Barracks, Pa., one of us (T. S.) suffered a severe attack of acute dermatitis following a short exposure to tear gas (chloracetophenone, CN) in the course of a routine demonstration of war gases in the gas chamber in which all members of the class participated.

Experienced medical officers assure us that such a reaction is very rare, if indeed not unheard of.

While our present location and duties do not permit us ready access to the literature, and we therefore are unable to cite previous reports of this reaction, it is our belief that a generalized cutaneous allergic reaction to tear gas (CN) is exceedingly rare.

REPORT OF CASE

T. S., aged 43, who had been inducted into the federal service approximately two months before and since April 1 had been a student in the Medical Field Service School, on the afternoon of April 16 passed through the gas chamber containing approximately one tenth the concentration of chloracetophenone that might be expected under field conditions. During the demonstration all students in the class (559) spend about five minutes within the gas chamber, protected by the training mask, at the end of which time they are required to remove the mask and make their way to the exit of the gas chamber about 10 or 15 feet distant. All students were dressed alike in regulation wool shirts and slacks.

Within five minutes after exit from the gas chamber, the patient complained of generalized itching of the skin, which became progressively more severe during the early evening, until by 9 p. m. (four and one-half hours after the exposure) there was diffuse and intense reddening of the skin over the entire body excepting the feet and the portions of the face covered by the training mask. His temperature was 102 F. The following day was spent in severe discomfort because of the itching, although the patient continued his duties as a member of the student officers class. His temperature by that evening had risen to 103 F. The second day following the exposure small blebs 1 to 2 mm. in diameter appeared in many places over the body in moderate numbers. The patient felt ill and very uncomfortable and had no desire for food. The generalized reddening of the skin continued and the temperature remained elevated, varying from 102 F. to 103 F. During this day the patient remained in his quarters.

During the afternoon, severe subcutaneous edema developed over the scalp and forehead, which strikingly altered the appearance of the face, giving it a grotesque, misshapen contour. That part of the forehead not protected by the mask appeared to overhang the orbital ridge, giving the eyes a deeply sunken aspect. Mild generalized edema was apparent in all subcutaneous tissue. Moderate edema of the scrotum developed. The generalized itching of the skin continued, and a mild rash and reddening of the skin appeared on all exposed parts, that is everywhere except the feet and the facial area protected by the mask. By evening there was a severe headache.

Treatment, in the dispensary up to this time, had consisted chiefly of the liberal application of calamine lotion to all affected parts. Because of severe headache and general malaise, the patient was sent to the station hospital, where with general supportive measures, in the course of four days, the signs and symptoms gradually subsided and the temperature returned to normal, although those who knew the patient well did not consider him to be fully recovered until a full month had elapsed. The desquamation of skin, profuse after the sixth day, gradually diminished, though it, too, did not entirely cease until some three or four weeks following the exposure.

Of particular interest in the case is the fact that once before the patient had, on transient exposure by passing through a cloud of tear gas during a course of instruction while in the National Guard, experienced itching of the skin which, though remembered seventeen years after the event, was not incapacitating. (The exposure in this instance was, of course, not nearly so great as that experienced in the gas chamber.)

COMMENT

It is our belief that the case is one of idiopathic hypersensitivity to tear gas (CN) and that it may be considered an allergic type of reaction in all parts of the skin exposed to the tear gas.

We know of but one other case, one of "mild dermatitis," occurring in an officer of the Twenty-Seventh Division, reported to us in a letter from an officer¹ who had also observed the case here reported.

CONCLUSION

The severe subcutaneous edema and desquamation following exposure to a light concentration of chloracetophenone (tear gas) is considered an allergic reaction to the chloracetophenone.

1. Personal communication from Major Wilbur R. Southward Jr., One Hundred and Fourth Medical Regiment, Fort George G. Meade, Md.

THE USE OF HISTAMINASE BY MOUTH IN PRE-
VENTING SYSTEMIC REACTIONS TO PAREN-
TERAL LIVER EXTRACT

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The relative infrequency of severe reactions to liver extract is indicated by the fact that there are only 34 cases reported in the literature.¹ The important data on these cases are shown in the accompanying table. In all but 2 instances the preparation was given parenterally. In many of the cases there was no previous history of abnormal sensitivity. That the sensitivity is acquired is indicated by the fact that in nearly every instance reactions occurred only after a number of injections had been given. The nature of the reactions varied from prolonged, generalized urticaria or pruritus to shocklike symptoms. It has been demonstrated (Crip¹) that the sensitivity is to the liver as an organ and not to the general animal antigen. Passive transfer of sensitivity was accomplished in all cases in which it was attempted. One exception to these statements was the case of Milbradt's¹ in which there was sensitivity to the benzene ring

CASE 1.—A woman aged 75 stated that she could not eat beef because it caused her to have nausea and griping abdominal pains. In June 1937 it was proved that she had pernicious anemia and she was given 3 cc. of "campolon"² intramuscularly daily for thirteen days. An oral preparation was then given for several months. In November 1939 she was given 1 cc. of liver extract (exact type unknown) intramuscularly on two occasions without reaction and on May 25, 1940 she was started on 1 cc. of "reticulogen"³ intramuscularly, and this was repeated at weekly intervals until July 25, 1940 and thereafter once a month. After the fifth injection, she complained of severe generalized pruritus and nausea and vomiting. This recurred more severely with each injection, so that in October 1940 she refused further injections. On Jan. 28, 1941, she was admitted to the University of Minnesota Hospital in an extremely weak condition and with a hemoglobin level of only 2.8 Gm. per hundred cubic centimeters of blood. She was given 2 cc. of "reticulogen" intramuscularly without reaction. Ten days later when the patient's hemoglobin was 5 Gm. per hundred cubic centimeters of blood, and she was considerably

Reported Cases of Severe Reactions to Liver Therapy

Author	Date	No. of Cases	Method of Treatment	Allergic History	Prausnitz-Küstner Reaction	Intradermal Tests			Ultimate Treatment
						Liver Extract	Liver Antigen	Animal Antigen	
Schlesinger.....	1930	1	Parenteral				+	..	Oral hog stomach
	1931	1	Parenteral	+	..	+	..	..	Oral liver
	1931	1	Oral	..	..	..	..	..	Oral liver
	1932	1	Parenteral	+	..	..	..	..	Desensitized
Engel.....	1933	1	Parenteral	..	..	+	..	..	Desensitized (1 case)
Murphy.....	1933	2	Parenteral	..	..	..	..	..	Desensitized
Grun.....	1933	1	Parenteral	..	+	+	..	..
Segerdahl.....	1934	1	Parenteral	0					
Kuipers.....	1935	1	Parenteral						
Roovers.....	1935	3	Parenteral	..	..	..	..	..	Sensitive to one benzene ring preservative
Milbradt.....	1935	1	Parenteral						
Chaudhuri.....	1936	1	Parenteral						
Geijskes.....	1936	2	Parenteral	+	+	+	..	..	Oral hog stomach
Lasch.....	1936	1	Parenteral	..	..	..	..	..	Desensitized
McHenry.....	1936	3	Parenteral						
Ungley, Davidson and Wayne.....	1936	1	Parenteral						Oral therapy
Hofstrom.....	1937	2	Parenteral	..	..	..	..	..
Markoff.....	1938	3	Parenteral						Desensitized
Krantz.....	1938	1	Parenteral	..	..	+		0	
Gardner.....	1938	1	Oral	0					
Diena.....	1938	1	Parenteral	+	+	+	+	0	Oral therapy
Crip.....	1939	1	Parenteral	+	+	+	..	0	Parenteral horse liver extract
Jones.....	1939	1	Parenteral	0	+	+		..	Oral therapy
Diefenbach and Yuskis.....	1939	1	Parenteral	0	..	..	+	0	Oral therapy
Pache.....	1939	1	Parenteral	..	..	+	+	..

compound used as a preservative in the liver extract. Ultimate therapy for these patients has been either discontinuance of treatment if the patient did not have pernicious anemia, substitution of oral therapy or desensitization by gradually increasing doses of liver extract. It appeared that the last method was accomplished in 5 instances.

We have had an opportunity of studying 2 patients who had a strong sensitivity to parenteral liver extract.

From the Division of Internal Medicine, University of Minnesota Hospital.

1. The literature includes:

- Schlesinger, W.: Zur Frage der Leberbehandlung bei perniziöser Anämie als diätetischer Reiztherapie, Wien. med. Wchnschr. 80: 696 (May 17) 1930.
- Matzger, Edward: Bronchial Asthma Caused by Liver and Liver Extract Diet in a Patient Suffering from Primary Anemia, J. A. M. A. 96: 110 (Jan. 10) 1931.
- Held, I. W., and Goldbloom, A. A.: Addison-Biermer's Anemia (Pernicious Anemia): Report of Case Showing Allergic-like Phenomenon to Liver Extract, J. A. M. A. 96: 1361 (April 25) 1931.
- Strandell, B., and Hammar, E.: Magenresistente: Fälle von Anaemia perniciosa, erfolgreich mit Campolon behandelt: Urtikaria als Komplikation, Acta med. Scandinav. 77: 345, 1932.
- Engel, K.: Anaphylactic Reactions in Liver Preparations: Case of Pernicious Anemia, Bol. Assoc. méd. de Puerto Rico 25: 326 (May) 1933.
- Murphy, W. P.: Maintenance of Normal Blood in Pernicious Anemia by Means of Intramuscular Injections of a Solution of Liver Extract, Am. J. M. Sc. 186: 271 (Aug.) 1933.
- Grun, G.: Allergic Reactions to Injection of Liver Preparation, Orvosi hetil. 77: 736 (Aug. 19) 1933.
- Segerdahl, E.: Om behandling av pernicios anämi med intermittenta leverextraktinjektioner, Svenska läk-tidning. 31: 1706 (Dec. 28) 1934.
- Kuipers, F. C.: Overgevoeligheids reactie Na Leverinspuiting, Nederl. tijdschr. v. Geneesk. 79: 2771 (June 8) 1935.
- Roovers, J. J. C. P. A.: Arts, Onaangename Verschijnselen Na Per-naemoninspuitingen, Nederl. tijdschr. v. geneesk. 79: 5148 (Nov. 2) 1935.

stronger, she was again given 2 cc. of the preparation intramuscularly. Within fifteen minutes, severe generalized pruritus developed which lasted from fourteen to sixteen hours and was not relieved by epinephrine. She also vomited. Three weeks later, after having received 50 units of histaminase⁴ orally on the day of injection and 60 units daily for the two

- Milbradt, W.: Ueber eine eigenartige scheinbare Allergie gegen Leber-extrakt, Dermat. Wchnschr. 101: 1595 (Dec. 21) 1935.
- Chaudhuri, B. M.: Urticarial Rashes After Campolon Injection, Calcutta M. J. 30: 731 (June) 1936.
- Geijskes, P. A. G.: Onaangename Verschijnselen Na Toediening von Pernaemon, Nederl. tijdschr. v. geneesk. 80: 1915 (May 2) 1936.
- Lasch, F.: Ueber allergische Symptome bei parenteraler Lebertherapie, Wien. med. Wchnschr. 86: 126 (Feb. 1) 1936.
- McHenry, E. W.: Liver Therapy in the Treatment of Pernicious Anemia, Canad. Pub. Health J. 27: 421 (Sept.) 1936.
- Ungley, C. C.; Davidson, L. S. P., and Wayne, E. J.: Treatment of Pernicious Anemia with Dakin and West's Liver Fraction (Ana-haemin), Lancet 1: 349 (Feb. 15) 1936.
- Hofstrom, T. G.: Anafylaktisk chock i samband med heptomininjektion, Svenska läk-tidning. 34: 927 (June 26) 1937.
- Maikoff, N.: Zur Kenntnis einiger Arzneimittelüberempfindlichkeiten, Schweiz. med. Wchnschr. 68: 1016 (Aug. 27) 1938.
- Krantz, C. I.: Anaphylactic Reaction Following Medication with Parenteral Liver Extract, J. A. M. A. 110: 802 (March 12) 1938.
- Gardner, J. W.: Allergy to Oral Administration of Liver Concentrate, J. A. M. A. 110: 2003 (June 11) 1938.
- Diena, D.: Ipersensibilita a preparati epatici, Gior. d. r. Accad. di med. di Torino 101: 462 (Sept.) 1938.
- Crip, L. H.: Allergy to Liver Extract, J. A. M. A. 110: 506 (Feb. 12) 1938.
- Jones, C. A.: Allergic Reactions Following the Parenteral Administration of Liver Extract, New Internat. Clin. 3 (2): 258 (Sept.) 1939.
- Diefenbach, W. E., and Yuskis, A. S.: Allergy to Liver Extract, California & West. Med. 50: 28 (Jan.) 1939.
- Pache, H. D.: Beobachtungen bei Liver Allergie gegen Leberextrakte, Deutsche med. Wchnschr. 65: 1192 (July 28) 1939.
2. A preparation of liver extract put out by Winthrop Chemical Company, Inc.
3. Eli Lilly & Co.
4. "Torantil" (Winthrop Chemical Co., Inc.) 5 unit tablets.

preceding days, she tolerated 2 cc. of "reticulogen" intramuscularly without any reaction. Since that time the patient has been given 2 cc. injections on seven occasions when she was taking histaminase orally. She had no reactions. On four alternate occasions when she was not receiving histaminase she was given similar quantities of liver extract, and each time severe, prolonged, generalized pruritus and vomiting developed. There was no eosinophilia.

The "reticulogen" used was extracted from pork livers. Concentrated liver extract⁵ obtained from beef livers caused even a more severe reaction when injected intramuscularly. By intradermal tests the patient was shown to be sensitive to five commercial, parenteral liver extracts whether the animal source was swine or beef. With intradermal tests she was sensitive to beef, swine and chicken liver antigen but was sensitive only to the beef general antigen and not to the general antigen of swine or chicken. This is understandable when one recalls that the patient had a history of allergy to ingested beef. The intradermal tests with substances to which the patient was sensitive were definitely less pronounced when she was receiving histaminase. These reactions were checked frequently, so that we are convinced of their accuracy. It should be stressed, however, that at no time did the administration of histaminase affect the response to intradermal histamine.

On five occasions when the patient was not receiving histaminase the passive transfer of sensitivity for "reticulogen," beef swine and chicken liver antigens was strongly positive. When the patient was receiving the histaminase the passive transfer tests were definitely less positive or negative. Passive transfer was demonstrated for the beef general antigen. Precipitin tests were positive for "reticulogen" and the liver antigens but not for beef general antigen. This is understandable, since the sensitivity to beef is a true atopy while the sensitivity to liver extract and liver antigen is an acquired sensitivity to unusual contact with a foreign substance received by injection. True atopy according to Coca⁶ shows passive transfer but no precipitins, while the acquired sensitivity to foreign substances injected shows both of these phenomena. By quantitative determinations of the degree of flocculation with the Evelyn photoelectric colorimeter, it was strongly suggested that the precipitin test was decreased when the patient was taking histaminase.

CASE 27—A man aged 64 with no previous history of abnormal sensitivity was proved to have pernicious anemia in 1933 and was treated for several months with parenteral liver extract. He had no reactions, but because of his dislike for intramuscular injections he was given oral liver preparations for more than seven years. He was but poorly controlled during this period. In May 1941 he was started on 1 cc. injections of concentrated liver extract³ because oral therapy was not maintaining his hemoglobin and red blood cell count at a satisfactory level. Within ten minutes after the first injection severe generalized urticaria developed. This persisted for more than an hour in spite of treatment to relieve it. On five succeeding injections similar attacks occurred. On two occasions when he was taking oral histaminase he had no reactions. By intradermal tests he was shown to be sensitive to the liver as an organ and not to the general animal antigen. He differed from the first patient in that he had no atopic sensitivity. The intradermal reactions to liver extract were sharply reduced or negative when he was taking histaminase. The reactions to precipitin tests were positive for the liver extract and liver antigen but not for the general antigen of the animal source.

SUMMARY AND CONCLUSIONS

1. Two patients with pernicious anemia acquired severe sensitivity to parenteral liver extract.
2. The oral administration of histaminase for two days before and on the day of injection completely prevented the systemic reactions to the parenterally administered liver extract.

5. Lederle Laboratories, Inc.

6. Coca, A. F.; Walzer, Matthew, and Thommen, A. A.: *Asthma and Hay Fever in Theory and Practice*, Springfield, Ill., Charles C. Thomas, Publisher, 1931.

7. Dr. Phillip Hallock gave us his permission to study this case.

3. Definite, temporary reduction of the intradermal sensitivity to liver extracts followed the administration of histaminase. This was not true for the histamine sensitivity, however.

4. The passive transfer of sensitivity to the liver antigen became much less noticeable following histaminase.

5. We feel that a method by which the liver extract can be administered parenterally in therapeutic doses, as was done in the cases reported, has definite advantages over the previous methods of attempting to solve the problem of acquired sensitivity to liver.

Special Article

THE ÉMIGRÉ PHYSICIAN IN AMERICA, 1941

A REPORT OF THE NATIONAL COMMITTEE FOR
RESETTLEMENT OF FOREIGN PHYSICIANS

DAVID L. EDSALL, M.D.

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M. C. WINTERITZ, New Haven

The National Committee for Resettlement of Foreign Physicians was organized¹ more than two years ago to deal with one of the problems that have arisen out of the present European upheaval. Its name is self explanatory. Its objectives were few but vital:

1. To evaluate the eligibility of individual émigré physicians to practice medicine in the United States.
2. To assist those who were found competent in preparing for examinations and for American medical requirements.
3. To further their resettlement in those parts of the United States where medical services are needed.

The task has not been made any easier by the opposition which has arisen in certain quarters. Where once a medical degree from any noted European university was considered proof of outstanding scholarship, now there is a deplorable tendency to swing in the other direction. In incomprehensible isolation, legislators and others build bars around their own small domains, arbitrarily cutting off those valuable immigrants whose professional ability could contribute to the health of the whole nation. It is not the European physician who has changed; it is, at least partially, the American attitude. It is not the universities which they represent which have changed, except in the years since the Nazis have crushed culture in one European country after another. This reversal of attitude has become a major problem to the committee and hampered its work.

For further information, apply to Harry D. Biele, Secretary, National Committee for Resettlement of Foreign Physicians, 165 West 46th Street, New York.

1. Edsall, D. L.: *A Program for the Refugee Physician*, J. A. M. A. 112:1986 (May 13) 1939.

In its activities the committee has been conscious of its responsibility to the nation as a whole, to the profession and to the individual men and women involved. There is involved here a human problem that cannot be overlooked by members of a calling dedicated to the alleviation of mental as well as physical suffering.

TABLE 1.—Immigrant Physicians Admitted to the United States

From the U. S. Department of Labor Statistics		
Year	Total	Jewish
1933	187	41
1934	353	163
1935	304	137
1936	462	273
1937	533	310
1938	738	475
1939..	1,384	1,126
1940	1,095	832
	5,056	3,357
1941 (our estimate).	500	
	5,556	

We have been alert to the need for protecting American physicians from the possibility of unfair competition by émigrés. This involved careful planning and a long-range program of education of the refugees. The objective was the complete integration of the émigré physician to the American scene.

We recognized the great need for adequate medical service in many rural communities. And the apparent lack of interest in these areas among American physicians is giving us an opportunity to settle these physicians where they are really needed.

American medicine has already profited by the accomplishments of many of the recent immigrants who were given a chance to resume their work: Schindler (Chicago) in gastroscopy, Bergmann and Schoenheimer (New York) and Thannhauser (Boston) in metabolism, Witebsky (Buffalo) in hematology, and others.

TABLE 2.—Distribution by Age (in Half Decades) of Two Thousand One Hundred Foreign Physicians Registered with the National Committee

Age	Approximate Percentage
Over 65	15
60-64 ..	40
55-59 ..	55
50-54	100
45-49	180
40-44	250
35-39	90
30-34 ..	180
25-29 ..	90
Total	1000

ACTIVITIES OF THE COMMITTEE

The starting point for our own work was to set up committees and voluntary boards to evaluate the qualifications of registrants. At present the national committee is composed of state committees in Massachusetts, New York, New Jersey, Maryland, Connecticut, Virginia, Missouri, California, Colorado and Texas; cooperating groups or agencies are located in Louisiana, Tennessee, Minnesota, Ohio and Pennsylvania. State committees embracing the nine Pacific Slope states are

now in the process of formation. From each of the state committees several physicians were chosen to serve on the national committee.

Within each state the special committees act as advisory groups to the émigré physicians and cooperate with state licensing boards and local medical societies. They also locate rural opportunities and internships, and they evaluate individual émigrés considered for placement in practice or institutional work.

The New York State Board of Medical Examiners requires that candidates possess first citizenship papers and have passed an English examination. To exclude unfit persons from committee assistance it was the policy of the national committee in New York to require proficiency in English and a favorable professional evaluation by its advisory committee composed of American physicians, as well as approval of credentials by the New York Board of Medical Examiners.

For New York, where the concentration of émigré physicians is so great (about fifteen hundred in practice and fifteen hundred unlicensed), the national committee has adopted new rules in an attempt to relieve the pressure on the state board of examiners. At least one year's American internship is now required. All registrants who are acceptable for examination by the

TABLE 3.—Distribution by Nationality of Two Thousand One Hundred Foreign Physicians

Country of Origin	Approximate Percentage
Germany	48
Austria ..	24
Poland ..	10
Czechoslovakia	4
Hungary ..	4
Others (including Rumania, Yugoslavia, Lithuania, France, Latvia, Russia, Italy and The Netherlands) ..	10
Total	100

National Board of Medical Examiners are required to take this examination if they ask sponsorship of the committee.

STATISTICAL ANALYSIS OF COMMITTEE REGISTRANTS

In 1939 we² had looked forward to a decline in medical immigration. Instead, with the advent of the World War medical immigration remained at a high level in 1940. The total immigration from 1933 through 1940 is shown in table 1. It is equivalent to the total number of graduates in a single year from our own schools.

Approximately 85 per cent of the émigré physicians are male, 15 per cent female. The sectarian proportion remains approximately the same as previously reported, namely 60 to 75 per cent Jewish, 40 to 25 per cent Protestant and Catholic (table 1).

Tables 2, 3, 4 and 5 showing age, nationality and educational background for a group of two thousand one hundred foreign physicians among the four thousand registered with the National Committee for the Resettlement of Foreign Physicians may be considered representative of the entire group of émigré physicians in the United States. Most of these physicians are in the "middle years," looking ahead to many years of professional service (table 2).

² Edsall, D. L. The Emigré Physician in American Medicine, J. A. M. A. 114: 1068 (March 23) 1940

Within the last year, many qualified practitioners have arrived in this country from such nations as the Netherlands, Belgium, France and Norway (tables 3, 4 and 5).

As indicated in table 5, about half of the émigrés are interested in general practice. If those listed as intern-

TABLE 4.—*Location of Medical Schools (by Nations) from Which Two Thousand One Hundred Émigré Physicians Were Graduated*

Nationality of Medical Schools	Approximate Percentage
German.....	44
Austrian.....	35
Czechoslovakian.....	5
Italian.....	5
Swiss.....	4
Hungarian.....	2
French.....	2
Others.....	3
Total.....	100

ists are included, three fifths of the newcomers are available for this purpose. In addition, retraining specialists for general practice is consistently encouraged by the committee, particularly in the case of the younger men.

RESETTLEMENT

Seven hundred men and women have been located in American hospitals throughout the country: less than twenty-five complaints have been received regarding the physicians so resettled. From among the hundreds of physicians established in practice, only five have had to be relocated, and complaints have been made concerning only three. Occasional rumors of unethical conduct in practice have been brought to our attention, but in the great majority of instances investigated no proof has been obtained.

We find that the émigré physician who makes good and is accepted by the community and the medical fraternity is soon assimilated. But—and this is a sad reflection on our own outlook—if one émigré arouses attention by any single act, he frequently becomes the target of whispered, unfriendly and greatly exaggerated rumors which cause other émigrés to suffer stigmatization. Much gossip and false generalizations can be traced to prejudice, unfriendliness and an unwillingness to make allowance for the period of adaptation and assimilation necessary to transform an immigrant into an American.

During the process of sponsorship and resettlement, every effort is made to provide the émigré physician with facilities which will enable him to make a more rapid adjustment to American social conditions. The National Refugee Service, the American Friends' Service Committee and other agencies aid in the linguistic and cultural training of the émigré physicians. Special emphasis is placed on the preparation for general practice in the small communities.

When found suitable for sponsorship, émigrés are recommended for retraining in American medicine by placing them in internships. To date the committee has placed seven hundred émigrés in internships. (Many others have found such places without us.) Men found fit for practice after licensure have been carefully interviewed and, on the basis of recommendations by the advisory board, they have been settled in localities examined in advance. No physician has been placed without the approval of local authorities in a selected

community. To date, about five hundred physicians have been successfully resettled in small towns or villages in New York, Ohio, Illinois, California, Colorado, Maryland, New Jersey and Virginia. Some diplomates of the National Board have been placed in Maine, Washington, Kentucky and Utah.

Recently the committee sent a field secretary on a trip through New York State to visit émigré doctors in their new homes and to report on the progress of their assimilation. After interviewing forty physicians settled in small communities, he concluded:

Assimilation of a foreigner may be said to be complete when he is "in" as well as "of" his community. It may be said with assurance (for there were only two deviations) that in this group assimilation varies inversely with the size of the community—it is nearest completion in the villages, less so in the towns and least so in the cities.

The two principal factors in these doctors' progress are their skill and their social adjustment. Almost all the foreign doctors are—within their varying environments—earning their way modestly. Some communities are enjoying better medical service than they ever had before—small villages from which previous doctors had moved, and farming areas with few physicians, some aged. For it is in these districts that the new doctors are, with the least dislocation of other established practices, rendering the best service.

There are many evidences of acceptance in rural areas. Several alien doctors are members of local fire departments; one is on the state police list for calls in highway accidents; several are members of the local Grange and Rotary club; and a number of wives are members of local women's organizations and church groups.

It is also clear that prejudice is a less hindering factor than competition. Resistance to the establishment of a new practice is not felt alone by aliens (Jewish or non-Jewish), especially in towns where the established doctors have formed a protective clique; disapproval and sometimes open hostility may be the fate of the newcomer, whatever his origin.

TABLE 5.—*Specialties of Two Thousand One Hundred Foreign Physicians Registered with the National Committee*

Specialty	Approximate Percentage
General practice.....	46.5
Internal medicine.....	12.5
Pediatrics.....	6.5
Obstetrics and gynecology.....	5.0
Dermatology.....	4.0
Neurology and psychology.....	3.0
Surgery.....	3.0
Ear, nose and throat.....	2.5
Ophthalmology.....	2.0
Tuberculosis.....	1.0
X-ray and radiology.....	1.0
Pathology.....	1.0
Orthopedic surgery.....	1.0
Physical therapy.....	1.0
Urology.....	1.0
Others.....	4.0
(Dentists).....	(5.0)
Total.....	100.0

There have been, from time to time, "spy scares" involving the foreign doctors. One refers rather ruefully to the "crisis" he passed through last winter; another has heard reports of whisperings about his practices—principally that he is dispensing a slow-acting poison (!) in his pills. Both have emerged from these difficulties by attending conscientiously to their work.

If they are to remain in rural localities, it is essential not only that the doctors be adjustable to our way of life and our medical practices but also that their families fit into the pattern of the community. When one doctor says smilingly "my wife

has more callers than I" and another says "there's my best ambassador," as his little daughter enters the room, and a doctor's wife says "my son is out with the gang all day, he only comes in to eat," and another doctor's wife gets well into a tennis tournament in which she is the only woman, and the Progress Club elects a lady very recently of Berlin—then these families are well on the way to being good normal American citizens. This is in the best American tradition and it is not surprising. Are they any less desirable as fellow citizens

TABLE 6—Comparison of Population and Physicians by States* (1906 and 1940)

State	1906			1940			Percentage Change in Ratio
	No of Physicians	Population†	Ratio	No of Physicians	Population†	Ratio	
Alabama...	2,117	1,923,294	1. 910	2,075	2,851,000	1. 1358	- 53
Arizona ..	203	133,335	1. 655	594	409,000	1. 688	- 5
Arkansas ..	2,322	1,366,119	1. 587	1,829	2,037,000	1. 1112	- 90
California..	3,990	1,561,266	1. 392	11,909	6,110,000	1. 512	- 31
Colorado...	1,550	574,000	1. 371	1,964	1,069,000	1. 544	- 47
Connecticut	1,332	956,789	1. 720	2,598	1,738,000	1. 670	+ 7
Delaware ..	222	184,753	1. 834	339	269,000	1. 766	+ 8
Dist Columbia.	1,100	326,135	1. 296	2,243	623,000	1. 297	- 0.3
Florida.....	619	566,885	1. 916	2,276	1,637,000	1. 728	+ 20
Georgia....	2,778	2,336,404	1. 842	2,825	3,073,000	1. 1093	- 29
Idaho ..	259	183,738	1. 709	423	489,000	1. 1153	- 62
Illinois ..	9,419	5,117,056	1. 543	12,188	7,863,000	1. 645	- 19
Indiana.	4,908	2,614,223	1. 535	4,132	3,467,000	1. 840	- 57
Iowa	3,517	2,336,481	1. 663	3,084	2,548,000	1. 826	- 25
Kansas...	2,321	1,469,960	1. 642	2,070	1,574,000	1. 906	- 43
Kentucky.	3,761	2,330,619	1. 592	1,893	2,003,000	1. 1532	-150
Louisiana ...	1,551	1,460,237	1. 942	2,464	2,127,000	1. 863	+ 8
Maine ..	1,116	702,875	1. 630	992	855,000	1. 862	- 37
Maryland	1,810	1,231,739	1. 681	2,988	1,677,000	1. 559	+ 18
Massachusetts.	5,372	2,974,031	1. 552	7,889	4,425,000	1. 561	- 2
Michigan	4,966	2,510,647	1. 616	6,362	4,808,000	1. 756	- 23
Minnesota.	1,916	1,857,462	1. 953	3,527	2,644,000	1. 750	+ 21
Mississippi.	1,760	1,629,771	1. 926	1,497	2,016,000	1. 1346	- 46
Missouri...	5,936	2,227,214	1. 542	5,297	3,975,000	1. 750	- 38
Montana	345	277,102	1. 830	577	535,000	1. 997	- 20
Nebraska	1,668	1,008,139	1. 638	1,615	1,364,000	1. 835	- 27
Nevada ..	138	40,829	1. 296	167	101,000	1. 694	-104
New Hampshire	616	422,109	1. 653	656	509,000	1. 775	- 19
New Jersey...	2,312	2,016,797	1. 865	5,813	4,336,000	1. 747	+ 14
New Mexico.	221	265,819	1. 931	439	422,000	1. 961	- 3
New York	11,982	7,659,784	1. 639	27,396	12,948,000	1. 473	+ 26
North Carolina	1,453	1,976,541	1. 1360	2,740	3,476,000	1. 1269	+ 8
North Dakota.	451	357,594	1. 793	518	705,000	1. 1360	- 72
Ohio	7,710	4,302,860	1. 558	9,318	6,724,000	1. 723	- 30
Oklahoma	1,869	950,995	1. 509	2,352	2,549,000	1. 1079	-112
Oregon ..	696	464,685	1. 663	1,461	1,022,000	1. 700	- 5
Pennsylvania.	9,957	6,696,747	1. 663	13,529	10,158,000	1. 750	- 13
Rhode Island...	727	480,082	1. 609	961	681,000	1. 709	- 8
South Carolina	1,023	1,397,067	1. 1364	1,402	1,868,000	1. 1331	+ 2
South Dakota.	545	442,927	1. 815	508	692,000	1. 1360	- 67
Tennessee ..	2,980	2,095,223	1. 703	2,908	2,880,000	1. 992	- 41
Texas ..	4,825	3,285,474	1. 678	6,693	6,147,000	1. 890	- 32
Utah.....	304	295,404	1. 970	375	518,000	1. 901	+ 7
Vermont ..	646	347,007	1. 537	523	382,000	1. 730	- 36
Virginia	1,945	1,919,103	1. 985	2,889	2,690,000	1. 951	+ 6
Washington ..	1,023	870,510	1. 850	2,200	1,651,000	1. 750	+ 12
West Virginia.	1,409	1,021,100	1. 725	1,534	1,849,000	1. 1003	- 39
Wisconsin.	2,430	2,155,441	1. 887	3,523	2,918,000	1. 828	+ 7
Wyoming ..	174	202,535	1. 384	274	234,000	1. 855	- 46

* Compiled from data published in the Directories of the American Medical Association, 1906 and 1940
† Estimated 1903 Census.
‡ Estimated 1937 Census

then the unselected millions who used to pour into our country from every section of Europe? They should be more so, for they come with professional equipment at a time when every agency of government is clamoring for the very services they can render. Many have come to us after years of successful urban practice or institutional service; some are experienced specialists; the wisest of them are settling into the simple routine of the country practitioner; these are very humble and very grateful

In line with the committee's policy, the experimental program which is operating in Virginia this year provides an example of carefully planned resettlement. In that state some candidates sponsored by the national committee after previous examination by its New York division and the Virginia committee are being permitted to take the medical examinations by special agreement with the Virginia Board of Medical Examiners. The number of rural communities short of physicians determine the number admitted to the examination, and successful candidates are being resettled in the chosen communities.

This committee is not unaware of its limitations. It is not a legal agency and its service is advisory. It realizes that in large groups of émigré physicians there would be unfit as well as qualified persons and within the limits of its capacity it has endeavored to exclude those proved to be incapable. Among the reasons for exclusion are the handicap of advanced age, the limitation of opportunity for certain specialists, inferior ability as indicated in failure in examinations, inadequate medical training, language difficulty, serious physical handicaps, mental difficulties or failure to cooperate with the committee's program. In the period from July 1, 1940 to Aug. 1, 1941 more than one hundred and eighty physicians have been taken off our rolls for various reasons and advised to find other occupation. Wherever possible, refraining in some other field was offered through cooperating agencies.

INADEQUATE NUMBER OF PHYSICIANS

There is developing out of the present national emergency an increasingly acute need for physicians. The Office of Production Management and other federal agencies, for example, estimate that within the next six months or a year there will be a 10 per cent decrease in the number of physicians available for civil wants. The possibility of using qualified émigrés has been recognized by the House of Delegates of the American Medical Association, which recently recommended that its Committee on Medical Preparedness seek to work out a plan to utilize the services of foreign physicians wherever they are needed.

The needs of the Army and Navy are so great that some agencies have urged medical schools to increase their enrolment for next year. The noncitizen émigré is not eligible for military service as a commissioned officer in the Medical Corps, but some have been drafted and are serving with the armed forces. The shortage of physicians is obviously becoming more acute as the Army and Navy call up more men. At the same time the requirements of defense production centers have increased as population shifts have taken place to meet the increased demand for labor.

Recently it was announced that the British government requires about one thousand physicians for civilian and military purposes. Although many émigré doctors volunteered, they could not be accepted because they were not American citizens and were not acceptable to the British government. The same limitations bar their use in the American Red Cross.

PRESENT NEEDS

Apart from the immediately emergent situation there is an older problem. In its efforts to resettle émigrés the committee has sought out the communities where physicians were needed. Its field secretaries in contact with state boards, hospitals and public health agencies have located many places eager to employ any qualified physician in rural communities.

While the general population of the United States has increased, the medical census has not kept pace. Taken by states, there have been some remarkable changes in the past thirty-five years, as indicated in table 6, comparing the individual states as to population and the number of physicians in each as cited in the American Medical Directory in 1906 and 1940 (table 6). Although the population has increased in every state, the number of physicians has fallen in thirteen—in some as much as 30 to 50 per cent.

The committee knows no standard of reference to determine the ideal ratio of physicians to the population. Variables such as area, population, density, per capita income and professional and cultural advantages all play a role.

However, it is obvious that there are many states with too few physicians for their population. In eighteen the ratios range from 1 physician to 901 persons to 1 physician to 1,532 persons. These states include the ones which have had the greatest decreases in the ratio of physicians to population during the past thirty-five years. Only four of these states have had an increase in the number of physicians in relation to the population (South Carolina, North Carolina, Utah and Virginia) but this has been less than 10 per cent in each. These are largely rural communities where medical service is time consuming and costly (charges are often made for mileage involved in each call). Of necessity, medical service is relatively inaccessible. Yet, despite the obvious need, only Virginia and Tennessee have not restricted the settlement of qualified physicians who have been educated abroad. This applies alike to citizens or bona fide immigrants with first papers. In addition to these eighteen states, sixteen others have steadily suffered decreases in the relative proportions of physicians to the general population.

The steady shift in the location of young American graduates from rural to urban areas was shown by Mayer and Harrison³ in their study of the distribution of physicians in the United States. In 1906, 29.4 per cent of the graduates of 1901-1905 had established themselves in cities with populations over 100,000. In 1923, 51.7 per cent of all those who had been graduated between 1916 and 1920 settled in such localities. And the general proportion of physicians in cities over 100,000 increased from 37.9 per cent in 1923 to 46.2 per cent in 1931. Despite the fact that nearly half of the United States population lives in communities with a population of 5,000 or less, the flow of physicians into cities was such that in 1931 less than 20 per cent of the 1920-1925 graduates settled in such places.

In the territories under the jurisdiction of the federal government, the shortage of physicians is acute. Puerto Rico and Alaska both contain a fairly large population of persons who are wards of the government. In the Indian territories the Medical Service has been understaffed for years while the Indian population has been growing at the highest birth rate registered anywhere in this country. The Department of the Interior has recognized this problem and as an experiment this year it has accepted seven carefully selected émigrés as volunteer assistants in hospitals in the Indian territories. If this experiment works successfully and men are available, it may be extended in the future.

ÉMIGRÉ RESTRICTIONS

There is no doubt, therefore, that we are facing an increasing shortage of native physicians. Despite this and despite the unquestioned ability of most refugee physicians to fill it, there is a complex network of legal or semilegal restrictions which stands in the way. Unfortunately, discrimination against the licensure of legally admitted émigrés has increased in many states during the two and a half years of the committee's operation. This discrimination had contributed directly to their congregation in New York, in Boston and to a lesser degree in Chicago, San Francisco and Los Angeles—communities where they have had some chance to do useful medical work and maintain some kind of professional status.

Four types of rulings, or legislations, serve to bar émigré physicians from pursuing their professional careers, even though they are in the process of becoming citizens. These are:

1. The statutory law, or administrative ruling by the state licensing boards, requiring citizenship before admission to a licensing examination.
2. State board rulings which exclude graduates of foreign schools on the ground that there is insufficient information concerning the mode of education and quality of instruction in those schools.
3. A law recently passed in California which denies licensure to all graduates of foreign schools unless the country in which the school is located engages in international reciprocity with American licentiates.
4. The restriction (usually by state board ruling) requiring graduation from an approved American school before admission to the state licensing examination.

Certainly the ultimate attainment of citizenship is highly desirable, but no law or administrative requirement should work to the detriment of the prospective citizen or the community. It is short sighted to retard assimilation and Americanization by barring an otherwise bona fide immigrant from the pursuit of his professional career for five years. The result is liable to be deterioration as a doctor through nonpractice and loss of morale. The New York State law (adopted by a few states) which requires first papers before licensure, and revocation of the license if full citizenship is not obtained within ten years of its issuance, is a model which all the other states might well follow.

Because of new efforts to bar alien physicians by requiring full citizenship, let us consider the validity of some of the arguments for such restriction. One is that, since a practicing physician has as his responsibility the life and well-being of his patient, such a calling with its high degree of personal responsibility should not be entrusted to an alien. Another is that an alien physician might be more likely to perform illegal operations than a citizen physician. Some also argue that, since a physician prescribes narcotics and may be called on to assist in the administration of public health and quarantine law, some activities in the practice of the profession approximate the holding of public office. This thinking confuses administration of law with observance of its provisions. The physician, unless he is appointed as a quarantine officer, has no police authority over enforcement of public health laws. His duty is simply to obey their provisions after he has been instructed in them. If an alien physician is in the process of becoming a citizen there can be no doubt of his personal or civic responsibility.

3. Mayer, L., and Harrison, L. V.: *Distribution of Physicians in the United States*, New York, General Education Board, 1924.

Many states permit licensure for physicians who have declared their intention to become citizens. The United States Supreme Court has pointed out⁴ that "the rights, privileges, and duties of alien declarants . . . differ substantially from those of nondeclarants." These distinctions are even more apparent in the case of the political or religious refugee who, because of legislation in his native country, has become "stateless."

The notion that the alien physician has any other allegiance that may influence his observations of law has no basis. Under existing statutes⁵ he is now equally liable to regular military duty as any native or naturalized citizen. That he cannot be used in the Medical Corps is surely no fault of his own. In the committee's experience, most émigré physicians would be glad to serve in that way, and the Army or Navy could use their services. They might profit from the special knowledge of those experienced in German or other European military medical methods. In other words, the immigrant doctor, obeying the law, is prevented by that very law from playing his full part in national defense. The obvious conclusion here is that some way ought to be worked out which will allow him to do so.

The United States Supreme Court has recorded⁶ a principle for all law makers to remember:

The courts are not bound by mere forms, nor are they to be misled by mere pretenses. They are at liberty—indeed, are under a solemn duty—to look at the substance of things, whenever they enter upon the inquiry whether the legislature has transcended the limits of its authority. If, therefore, a statute purporting to have been enacted to protect the public health, the public morals or the public safety has no real or substantial relation to those objects, or it is a palpable invasion of rights secured by the fundamental law, it is the duty of the courts to so adjudge, and thereby give effect to the Constitution.

In a stirring message, Governor Dwight Green has recently vetoed a series of bills sponsored in Illinois which would have required citizenship for licensure in medicine and other professions. The Attorney General⁷ also ruled that the bills were unconstitutional and violated the fourteenth amendment to the United States Constitution. For a complete statement of the case against such laws, Governor Green's message can be quoted:

The Illinois laws and regulations concerning regulation for and practice of medicine exact high qualifications from those who seek their privilege, and those who enforce these regulations are fully competent to determine the attainments of every applicant.

If there are those who are unqualified to practice medicine, this is determined as it would be in the case of any citizen applicant. When those who apply are found qualified, however, we are given the advantage of their skill and this advantage is gained at a time when national preparedness through the induction of great numbers of men in our professions has depleted the number of those available for home service.

In more than half the world, the forces of oppression and totalitarianism are at war to destroy the principles of free democracy. This nation still stands forth as the one in which the rights of the individual to sustain himself by his own efforts are guaranteed. I do not believe that this is the time at which to weaken, or withdraw, that guaranty of freedom and opportunity.

4. *Porterfield v. Webb*, 263 U. S. 225; *Webb v. O'Brien*, U. S. 313; *Frick v. Webb*, 263 U. S. 326.

5. *Terrace v. Thompson*, 263 U. S. 197; 218 Act of Aug. 31, 1918, chapter 166; 40 Stat. 76, 884, 955.

6. *Mugler v. Kansas*, 123 U. S. 623, p. 661.

7. The attorney generals of South Dakota in 1926, of Texas in 1939 and of Utah in 1939 also held such legislation to be unconstitutional.

Many unfortunate but meritorious people have been driven from their homes and places of employment to seek such freedom as is granted under our constitutional form of government.

Many of them are persons of high professional attainment. There is little likelihood that any of them would become a charge upon the state. The State Department of Registration and Education estimates that there are now two hundred and twenty-eight applications by aliens pending for licenses in various occupations and professions and of this number one hundred are from physicians.

Neither is there a probability that they would not welcome the opportunity, as soon as it was legally available, to become naturalized citizens of the country in which they have sought the right of liberty.

A great many American born men and women who stand highest in our professional and business life are directly descended from those of alien birth who similarly sought liberty and safety in this country generations ago. Had our states, or national government, denied freedom of opportunity to them, this nation would have been deprived of many of its worthiest citizens of today.

It is in a time such as this that official and personal relations should be conducted upon the most liberal interpretation of liberty.

There is another type of restrictive action based on the allegation that there is insufficient information to determine the reputability and good standing of medical schools in foreign countries. Resolutions along these lines have been introduced within a few months of each other in the Illinois Medical Society⁸ and the New York State Medical Society⁹ using virtually the same language. They recommend that recognition for medical licensure in the respective state, whether after examination or otherwise, and irrespective of the question of citizenship of all graduates of medical schools located in the United States and Canada. Any other method of recognition is held as constituting the grossest type of discrimination in favor of foreign graduates. In New York this resolution, if made effective, would apply to candidates in the future. In Illinois the resolution went further and required that the inspection of the foreign schools be made expressly at the invitation of those schools and that the cost of the inspection should be defrayed by the foreign schools. Obviously, the latter requirement would seldom, if ever, be met by the Nazi rulers now in control of Europe's universities. These resolutions make no reference to the quality of instruction in any of the foreign schools, thus lumping together universities like Cambridge, Oxford, University College of London and the Universities of Munich, Freiburg and Berlin with less reputable schools.

An editorial in the *Connecticut State Medical Journal*¹⁰ says of this resolution:

The Illinois State Medical Society, while it admits the physical impossibility of determining the standard of foreign medical schools, requires that the admittedly impossible be done before graduates of foreign schools be admitted to practice. It would appear to us that this imposes an undue hardship on many reputable and desirable doctors who have trained in foreign schools. As long as it is so difficult to appraise foreign schools it would seem that the fair thing to do at this time would be to lay the stress of admission on the examination of the candidate both as to character and professional ability. Insistence that the candidate be a citizen of the United States, a matter previously discussed in this journal, while perhaps something of a hardship because of the residency

8. *Illinois Bans Graduates From Foreign Medical School*, editorial, *Illinois M. J.* 79:272 (April) 1941.

9. Report of Reference Committee on New Business & Licensure—Standards For Recognition of Foreign Medical Schools, Minutes of the Annual Meeting of the House of Delegates, New York State Medical Society, New York State J. Med. 41:1381 (July 1) 1941.

10. *The Foreign Graduate*, editorial, *Connecticut M. J.* 5:441 (June) 1941.

requirements, seems entirely justified. Interference with the right of a citizen of the United States to practice his chosen profession because he trained in a foreign school would seem both unjustified and unfair.

The deterioration of the continental schools that have come under the Nazi régime justifies barring graduates from such schools after the change, but no one can justify a retroactive ruling which would bar graduates of the leading European schools of earlier years. These resolutions ignore the realities concerning the good foreign schools of the past forty years.

As recently as in 1929 the Council on Medical Education and Hospitals of the American Medical Association stated:¹¹

With the requirements of two or more years of premedical study, medical education in the United States is now on a par with the requirements in other countries. Continuing, the report pointed out that there are three hundred and twenty-one bona fide medical schools in all countries outside the United States, giving a complete list of the schools.

Furthermore, lists of acceptable foreign schools have been compiled by the Royal Society of Great Britain and are used by the National Board of Medical Examiners. Graduates of inferior schools are already barred from taking the examinations of the National Board of Medical Examiners, whose high standards have won reciprocity for their diplomates in more than forty states in this country.

A bill was recently passed in California which would deny the license even to a California native son who happens to be a graduate of a foreign school, unless the country in which the school is located extends reciprocity to Americans. This would bar the foreign educated competent citizen physician, native or foreign born, from California forever. This is indeed chauvinistic legislation of the most deplorable type. How it can be construed to be in the interests of the public welfare is difficult to see.

A further barrier to the equitable distribution of qualified refugees has been created by licensing boards which have withdrawn reciprocity from those states in which émigrés have been admitted to licensure. This certainly cannot be justified in the light of admittedly increasing needs.

In a class with restrictive rulings directed toward applicants for licenses is the deplorable effort in some county medical societies to deny admission to membership of foreign physicians who are licensed. Some have required citizenship; others have ruled that applicants be graduates of class A American schools. Membership in the county society is often necessary for hospital practice and is considered the natural prerequisite to good standing in the medical fraternity. These requirements are degrading to the licensed émigré with first papers who is doing his best to become a reputable member of the whole community. The only reason behind such rulings must be fear of competition or rank prejudice.

Sickness knows no citizenship, and our profession must always stand for a liberal and reasonable policy. We must strive to maintain high tradition which our world has inherited from the past. We know that the basis of all progress in science and learning is through international cooperation. In no other form of human

activity has there been so complete an internationalism as in medical science. If this is true in the scientific realm it should be no less true in the application of the science to the needs of the sick. The tools we use bear the names of every nation and race.

RECOMMENDATIONS

All the new needs for physicians certainly should provide the avenue to a solution of the problems created by the concentration of foreign physicians in New York and in a few other cities. A constructive attitude on the part of organized medicine and a comprehensive resettlement program would greatly serve the public interest.

Many state licensing boards have the power to issue licenses of a temporary or a limited nature. Citizenship at the earliest possible moment may be made a condition of such a license. Some states may even define the areas of practice in which the license may be used. Such regional licenses with proper clauses for revocation should satisfy any skeptic by giving the émigré physicians the test of assimilability and fitness.

By cooperation with the United States Public Health Service and local state agencies, employment of qualified foreign physicians could be arranged in medically needy areas developing out of the national defense program.¹²

The *New York Medical Week*¹³ and the president¹⁴ of the Medical Society of the State of New York have both pleaded for the use of loyal refugees in the defense program. The *Medical Week* comments too:

At the present time there are over 2,500 medical refugees located in this state. They have the qualifications, and many have the desire, to make valuable contribution to the defense program.

So far the government has refused to accept the services of these men. If this policy is continued, we will see the native American physician who serves his country, as all good citizens should, losing his practice to foreign colleagues who are refused the opportunity of similar service. The utilization of loyal refugees in the defense program would help to protect native Americans against permanent loss of their practices as a result of military service. It would also facilitate the assimilation of refugee physicians into American life and give spiritual as well as legal validity to their applications for citizenship.

There is no doubt that some kind of internship training in an American hospital is desirable before licensure of all young men, but justice and wisdom dictate that, in the case of men of middle age and over who have had abundant clinical experience, such a requirement is

12. In reply to an inquiry pertaining to the incorporation of alien physicians into the British defense program, the following communication was received from the British Library of Information in New York City: "The position briefly is as follows: For the first sixteen months of the war, though there was considerable pressure on the government from some quarters to admit alien doctors to work in hospitals or in some form of the national medical services, few were actually employed. One reason was that there was a general ban on doctors or medical students of enemy alien origin entering any hospital which gave treatment or was available for treatment to any members of His Majesty's Forces, and it was not until August 1940 that this ban was removed. During the autumn of 1940 an acute shortage of doctors developed, and a number of members of Parliament pressed for permission to be granted to all adequately qualified doctors to practice, whether they had British qualifications or not. In January, 1941, under the Medical Practitioner's (Temporary Registration) Order, 1941, it was provided that alien doctors with foreign qualifications might be admitted temporarily to the Medical Register. Since that time, applications from alien doctors are considered by the Central Medical War Committee, and, when approved, submitted for scrutiny to the security authorities. Doctors of enemy alien nationality are recommended for employment mainly in hospitals and institutions. On the 12th June 1941 it was stated in the House of Commons, that, apart from those alien doctors commissioned in British or Allied forces, two hundred and eighty-nine alien doctors had been registered under the Medical (Temporary Registration) Order, and cases were examined at the rate of 80 a week."

13. Editorial, *New York Medical Week* 20:4 (Aug. 30) 1941.

14. Kopecky, S. J. "The Role of the Doctor in the Defense Program," *New York State J. Med.* 41: 1487 (July) 1941.

11. Report of the Council on Medical Education, *J. A. M. A.* 93: 544 (Aug. 17) 1929.

not necessary. If the present demands for interns continue, it will be necessary for hospitals to accept much older men than in the past years. Until the present national crisis the committee was able to place only émigrés under 35, but in recent months hospitals have been willing to take men as old as 45 to 48.

There are at least fifteen hundred unplaced physicians who are available to meet increased needs. Many licensed émigrés now forced to practice in cities would grasp the opportunities available in the rural states. Most of them have little or no reserve resources and have eagerly sought any professional opportunities. In view of the success achieved with rural placements, more rural states should be urged to take a limited number each year.

State licensing boards now unable to evaluate European schools should apply the standards of the National Board of Medical Examiners. If this is insufficient they should require that applicants from foreign medical schools pass the examination of the National Board of Medical Examiners. Moreover, a committee should be set up with representatives of the state board of medical examiners, the Council on Medical Education and Hospitals of the American Medical Association and the National Board of Medical Examiners, which could prepare an up to date list of bona fide medical schools, giving the years of graduation which would be acceptable for admission to examination.

SUMMARY AND CONCLUSIONS

1. The National Committee for Resettlement of Foreign Physicians has succeeded in assisting and placing between twelve and fifteen hundred émigrés in internship or practice during the two and a half years of its existence; no serious complaints or maladjustments have occurred among 95 to 98 per cent of such placements.

2. Rural resettlement has been particularly successful in the few states still open to émigrés.

3. Because of increasing natural needs (especially in rural states) and the special needs arising from the present national emergency, ample opportunities exist to employ the unlicensed recent émigrés.

4. Cooperative action by all medical agencies, federal and state, together with the American Medical Association, could provide a plan to redistribute and resettle the qualified émigré physicians.

5. Tests for qualification in the form of state board or national board examination should be applied to all.

6. Younger émigrés (under 40) should be required to take internships before licensure.

7. All licenses should stipulate that the émigré applicant shall have first papers to obtain citizenship as soon as the law permits.

8. Temporary licenses with similar safeguards should be issued after successful examination, for use in selected areas through state licensing boards. Supervisory agencies of the state and the state medical societies should be available to check the work of the temporary licensees.

9. Proper resettlement of the qualified émigrés and the acceptance of some for Army and Navy needs will protect native Americans against permanent loss of their practices, if called to military service. Such action will also avoid overcrowding and undue competition in many cities and will contribute to the medical care of the nation as a whole.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

HOWARD A. CARTER, Secretary

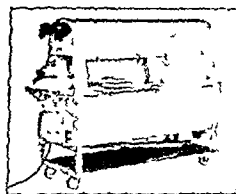
EMERSON FEVER CABINET ACCEPTABLE

Manufacturer: J. H. Emerson Company, 22 Cottage Park Avenue, Cambridge, Mass.

The Emerson Fever Cabinet provides a means of producing and maintaining artificial fever. The manufacturer states that while the apparatus is in operation a thermostatically controlled atmosphere is supplied to the chamber in which the patient lies and that 100 per cent humidity may be produced at any temperature, making it possible for a lower cabinet temperature to be used in producing the fever. It is also stated that as far as possible the movement of air in the cabinet has been eliminated, since such movement is a factor in heat loss.

The apparatus is portable and is protected electrically by a 30 ampere fuse. The cabinet is hinged at the foot end; this arrangement is said by the manufacturer to effect an economy in room space and to facilitate moving the patient in or out of the cabinet.

When closed, the cabinet may be locked securely. Two hinged doors located on each side of the cabinet make possible nursing care and the administration of intravenous solutions. The doors serve as shelves when lowered and are curtained to prevent in part the escape of the heated moist air. Electric control switches are located under the head rest out of the patient's view, and two air blowers at the head of the cabinet may be directed to blow on the patient's face. The interior of the cabinet is of stainless steel construction for ease in cleaning.



Emerson Fever Cabinet

All walls of the cabinet are insulated to conserve heat. A large reservoir of water is located in the lower half of the unit, and humidifiers which dip into the reservoir are used to force moist heated air into the upper cabinet during the induction of fever. The reservoir is limited to 150 degrees maximum water heat, and this temperature may be held at the desired level by the adjustment of the thermostat. A rectal thermometer remains in place during the treatment and indicates the patient's temperature at all times.

As evidence of the efficacy of the apparatus the firm asserts: Maintenance of fever is carried out with a minimum of air movement (the only movement of air in the cabinet when the doors are kept closed is the convection currents of heat rising in a closed chamber). This is important, as air movement over the surface of the body is one of the greatest factors effecting heat loss. In most cases fever is maintained with a temperature but a few degrees higher than the desired temperature of the patient. As the temperature at the very top (the hottest point in the cabinet) cannot exceed 116 to 124 F., there is a minimal danger of burning patients.

This cabinet and the previous model have been used for two years with satisfaction. The average induction time does not exceed that of other hyperthermia cabinets in general, average period of elevation to 104 F. has been about sixty five minutes, and to 107 F. two hours. This is the usual time which is provided for the induction of fever.

Patients have been treated for ten hours at peak temperatures of 106.8 F. and all other prescriptions required in fever therapy. By the simple maneuver of jacking up the bottom of the cabinet it is possible, through the shock position, to continue the patient's fever therapy when, under ordinary conditions due to fall of blood pressure, it would have otherwise been deemed inadvisable.

The advantage in this unit is economy in maintaining temperature and the comfort which the patient has during the maintenance period. It takes little heat to keep the patient's chamber balanced at the proper point to hold the patient at the desired level. Very flat plateaus of temperature are obtainable.

In the Council's investigation of the Emerson Fever Cabinet, the apparatus was used in a large fever therapy department and was found to be satisfactory both in raising the bodily temperature of patients and with respect to the patient's comfort. It was possible to produce a high humidity in the cabinet. There was little or no motion of air, and the patients were comfortable during treatment.

The Council voted to accept the Emerson Fever Cabinet for inclusion on its list of accepted devices.

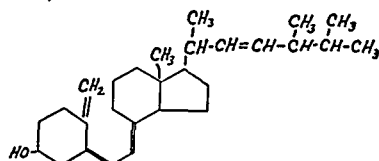
Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary

DRISDOL—Vitamin D₂—9||10 Ergostetraene (18 10, 5 6, 7 8, 22 23) ol-3—C₂₈H₄₄O



Vitamin D₂ may be prepared by ultraviolet irradiation of ergosterol in a suitable solvent or by electronic bombardment of the compound. It is not identical with the vitamin D which predominates in fish liver oils and which is called vitamin D₃. A method of preparation of vitamin D₂ is given in Addendum 1936 to the British Pharmacopoeia, 1932, page 20. The crystals have a potency of 40 units of vitamin D (U.S.P.) per microgram. (For methods of assay see U.S.P. XI, Second Supplement, page 136.)

Actions and Uses—Drisdol is used as an antirachitic. For allowable claims, see under allowable claims for vitamin D.

Dosage—Drisdol is administered as drisdol in propylene glycol. Average daily dose, 2 drops dissolved in total ration of modified or whole milk. If administered in water, gruel, etc., 4 drops daily for the average infant, and up to 15 drops daily for the premature or rapidly growing infant. Daily curative dose, 15 to 20 drops. The product is marketed with a special dropper delivering 250 U.S.P. units of vitamin D per drop.

Manufactured by the Winthrop Chemical Company, Inc., New York. U.S. patent 1,902,785, (expires March 21, 1950) and 2,030,792 (expires Feb. 11, 1953). U.S. Trademark 333,661.

Drisdol in Propylene Glycol, 5 cc Bottles. Contains approximately 0.25 mg of drisdol in each cubic centimeter of propylene glycol solution and has a potency of 10,000 units of vitamin D (U.S.P.) per gram. The propylene glycol used in the preparation of this product complies with the standards for propylene glycol N.N.R.

Drisdol in Propylene Glycol, 50 cc Bottles. Contains approximately 0.25 mg of drisdol in each cubic centimeter of propylene glycol solution and has a potency of 10,000 units of vitamin D (U.S.P.) per gram. The propylene glycol used in the preparation of this product complies with the standards for propylene glycol N.N.R.

Drisdol occurs as a colorless odorless acicular, crystalline substance. It is insoluble in water, soluble in alcohol, ether, chloroform, acetone, ethylene glycol and propylene glycol, sparingly soluble in vegetable oils. The melting point of drisdol lies between 115 and 118°C. Solutions of drisdol possess an absorption maximum at 2,640 angstroms.

Dissolve approximately 0.5 mg of drisdol in 5 cc of chloroform and add 3 drops of acetic anhydride and 3 drops of sulfuric acid and shake the mixture, a bright red color develops which rapidly changes to violet, blue and finally to green.

Dissolve 0.05 Gm of drisdol and 0.05 Gm of 3,5 dinitrobenzoyl chloride in separate 1 cc portions of anhydrous pyridine. Mix the solution and warm the mixture on the water bath for ten minutes. Add 5 cc of water, filter and wash the precipitate repeatedly with small amounts of cold water. Recrystallize the precipitated dinitrobenzoyl derivative twice from acetone and finally dry it in a desiccator under partial vacuum. The melting point of the product is from 147 to 149°C. The specific rotation $[\alpha]_D^{25}$ of the drisdol dinitrobenzoate dissolved in acetone + 80 degrees.

Dissolve approximately 0.01 Gm of drisdol in 1 cc of alcohol and add 1 cc of a 1 per cent solution of digitonin in 90 per cent alcohol, allow the mixture to stand for twelve hours. No precipitate occurs (absence of ergosterol).

Dissolve approximately 0.03 Gm of drisdol accurately weighed in 1 cc of acetone at 25°C. Polarize the solution in a 0.5 decimeter tube at 25°C using sodium light. The specific rotation lies between +79.5 and +83.5 degrees. Determine the amount of carbon and hydrogen present in drisdol by burning the substance in an appropriate combustion train, the carbon content should not be less than 84.6 per cent nor more than 85.1 per cent, the hydrogen content should not be less than 10.9 per cent nor more than 11.3 per cent.

NOVOCAIN (See New and Nonofficial Remedies, 1941, p. 81)

The following dosage form has been accepted

Nocean Supracain Solution 1 Per Cent. Each cubic centimeter contains procaine hydrochloride 0.01 Gm, epinephrine bitartrate 0.00001 Gm, sodium chloride 0.004 Gm, potassium sulfate 0.004 Gm. Marketed in 0.5 cc rubber diaphragm capped bottles accompanied by an air vent filter needle.

SULFAPYRIDINE (See New and Nonofficial Remedies, 1941, p. 511)

The following dosage form has been accepted

Tablets Sulfapyridine 0.065 Gm (1 grain)

Prepared by Eli Lilly & Co., Indianapolis. No U.S. patent or trademark.

SULFATHIAZOLE (See New and Nonofficial Remedies, 1941, p. 514)

Sulfathiazole-Endo—A brand of sulfathiazole N.N.R.

Manufactured by Endo Products, Inc., Richmond Hill, N.Y. No U.S. patent or trademark.

Tablets Sulfathiazole Endo, 0.5 Gm (7.7 grains)

Sulfathiazole-Smith-Dorsey.—A brand of sulfathiazole-N.N.R.

Manufactured by The Smith Dorsey Co., Lincoln, Neb. No U.S. patent or trademark.

Tablets Sulfathiazole, 0.5 Gm (7.5 grains)

Sulfathiazole-Lilly (See THE JOURNAL, Aug. 30, 1941, p. 680)

The following dosage form has been accepted

Tablets Sulfathiazole Lilly, 0.065 Gm (1 grain)

Sulfathiazole-Upjohn (See THE JOURNAL, Sept. 20, 1941, p. 1017)

The following dosage form has been accepted

Tablets Sulfathiazole Upjohn, 0.25 Gm (3.83 grains)

SODIUM r-LACTATE ONE-SIXTH MOLAR (See THE JOURNAL, Oct. 25, 1941, p. 1445)

One-Sixth Molar Sodium r-Lactate Solution.—A brand of sodium r-lactate one-sixth molar-N.N.R.

Manufactured by Baxter Laboratories, Inc., Glenview, Ill., and Don Baxter, Inc., Glendale, Calif. (American Hospital Supply Corporation, Chicago, eastern distributor). No U.S. patent or trademark.

One Sixth Molar Sodium r Lactate Solution in Vacoliter Containers. Each 100 cc contains sodium r-lactate 1.87 Gm in sterile distilled water. Also marketed in half size vacoliter containers.

Council on Foods and Nutrition

ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

FATS AND OILS (See Accepted Foods, 1939, p. 30)

Interstate Cotton Oil Refining Company, Sherman, Texas

Mrs. TUCKER'S SHORTEVING, hydrogenated cottonseed and soya bean oil with added lecithin.

Analysis (submitted by manufacturer).—Moisture, 0.05%, total solids (fat) 99.95%, fatty acids trace, iodine number 80 to 90, melting point 114°F., saponification value 192.

Calories—9 per gram, 255 per ounce.

FRUIT JUICES INCLUDING TOMATO JUICE (See Accepted Foods, 1939, p. 48)

Sunshine Foods, Inc., Lakeland, Fla. (plant at Winter Haven, Fla.), a subsidiary of Pomona Products Company, Griffin, Ga.

SUNSHINE BRAND ORANGE JUICE

Analysis (submitted by manufacturer).—Moisture 89.5%, total solids 10.5%, ash 0.4%, fat (ether extract) 0.1%, protein (N x 6.25) 0.5%, crude fiber 0.01%, carbohydrates other than crude fiber (by difference) 9.4%, acidity as citric acid 0.7%, peel oil 0.008%, pH 3.80.

The firm reports that the product contains from 31.2 to 46 mg per hundred cubic centimeters (624 to 920 international units per hundred cubic centimeters) as determined by the dye method and by iodine titration.

Calories—0.41 per gram, 12 per ounce.

MILK AND MILK PRODUCTS (See Accepted Foods, 1939, p. 230)

Minnesota Evaporated Milk Company, Winona, Minn.

GOLDEN GLOW BRAND EVAPORATED MILK

Analysis (submitted by manufacturer).—Moisture 73.0%, total solids 27.0%, ash 1.5%, fat (ether extract) 7.9%, protein (N x 6.38) 6.4%, lactose (by difference) 11.2%.

Calories—1.4 per gram, 39.8 per ounce.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, NOVEMBER 29, 1941

"PLAIN WORDS ABOUT VENEREAL DISEASE"

On Sunday morning November 16, newspapers which subscribe to the North American Newspaper Alliance published a copyrighted article written by Paul de Kruif heralding a forthcoming book by Drs. Thomas Parran and R. A. Vonderlehr entitled "Plain Words About Venereal Disease." De Kruif said that in their new book these authors "tell the story of how between one and two million of our young men, who were brought—free of venereal disease!—into the new army, are now being needlessly exposed to time-wasting gonorrhea and life-endangering syphilis, because the War Department and municipal authorities have seemed not to think it important to apply the powerful preventive measures that Secretary of War Newton D. Baker and Gen. John J. Pershing used—with brilliant success—in World War I, twenty-four years ago." After reviewing the campaign against venereal disease waged by Dr. Parran since he became Surgeon General, de Kruif points out that those rejected by the Army because of venereal disease are thrown back into civilian life and are not the army's business. And he proceeds "But it was definitely the army's business to see to it that its now more than a million of young men, all of them, venereally speaking, clean as a hound's tooth, should be kept that way." He points out that venereal disease rates fell in the Army at first because of the dilution brought about by a great increment of men free from venereal disease. However, he proceeds "Now, as of June 1941, the gonorrhea rate has shot up from 27.7 to 40.3. And the syphilis rate is rapidly climbing back up to the premobilization rate. . . . This can lead us to one terrible conclusion: that scores of thousands of soldiers are now being infected in the vice dives around the Army camps." In contrast to this statement of de Kruif, presumably based on the book, a release by the War Department, November 14, states that "In 1917, the annual rate for all venereal diseases was 107 in 1,000 soldiers. In 1918 it was 90 per 1,000. The present annual rate approximates 40 per 1,000. The annual rate for syphilis in the Army was 17.56 per 1,000 in

1918. This rate dropped progressively to 6.59 in 1939, 5.7 in 1940 and in August 1941 it dropped to 5.5." Moreover, a statement made by Mark S. Watson in the *Baltimore Sun*, November 16, says "The de Kruif statement that the gonorrhea rate alone had soared from 27 to 40 per thousand is not supported by the figures so far studied in the Medical Corps' detailed report." Perhaps these discrepancies in figures are explainable. The Army Medical Department may well resent charges based on exaggerations. There seems to be every reason to believe that the venereal disease incidence in the Army is steadily declining. That, however, is not the main issue raised by the Parran-Vonderlehr book.

The chief issues raised by the de Kruif advance publicity and by this book itself is the charge that the Secretary of War has been lax. To quote the book itself (p. 81):

Infections do not occur in the camps. The source of all venereal infection lies in the civilian population. It follows that the protection of soldiers, sailors and defense workers from syphilis and gonorrhea is a civilian responsibility. It is a responsibility which civilians could be organized to carry with less difficulty if the Secretary of War would take a leaf from the book of Secretary of War Newton D. Baker.

The thesis of the Parran-Vonderlehr volume is that the May act, passed in July 1941, ought to be made fully effective. "Under the provisions of this Act," to quote the book (p. 88), "It is unlawful to engage in prostitution, to aid and abet prostitution, to keep a house of ill fame, or to rent or permit the use of a vehicle or building for that purpose within such areas around military and naval establishments as the Secretaries of War and Navy may designate in order to protect the health and welfare of the forces. The Federal Bureau of Investigation is responsible for its enforcement." Then the book charges (pp. 89-90) "The plan on paper is perfect. Already some ground gained has been lost. Unless vigorous Federal action is initiated, we may sink to the level of France in our tolerance of prostitution." This charge is further explained (p. 118): "The May Act comes into the picture in that it gives the military commanders the power of initiating action where local interest centers more in the exploitation of the soldier than in the desire to keep him fit to fight."

Now the phrases that have been quoted must be examined in the light of what has actually occurred since the May act was passed in July 1941. In the first place the chief of staff, G. C. Marshall, by order of the Secretary of War, issued circular 170 on August 16, 1941. This circular says:

II.—*Prohibition of prostitution within reasonable distance of Military Establishments.*—The following procedure is prescribed in order to carry out effectively the provisions of the act of Congress approved July 11, 1941 (sec. I, Bull. No. 23, W. D., 1941):

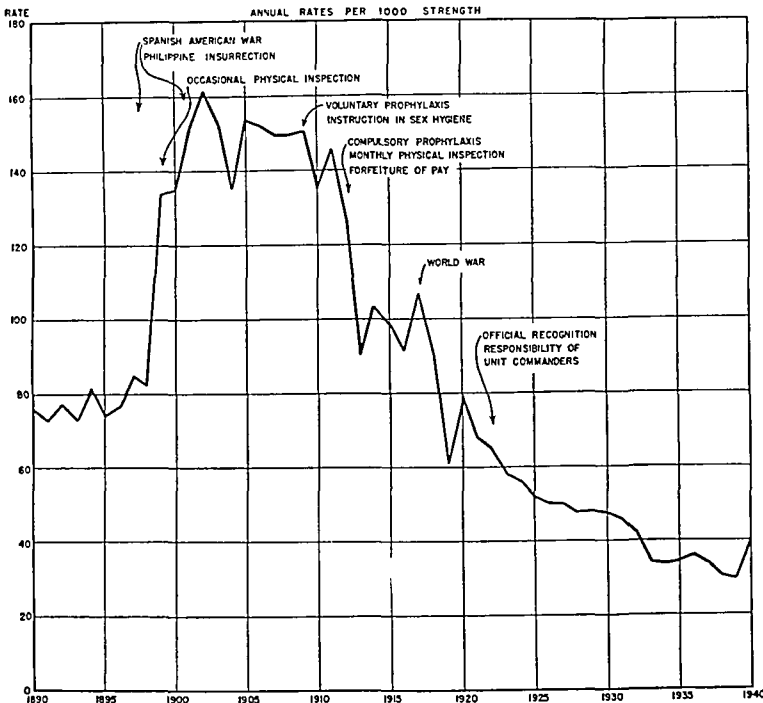
1. The commanding officer of each post, camp, or station is basically responsible for determining if and when prostitution in areas adjacent to the military reservation adversely affects

the efficiency, health, and welfare of the personnel of the post, camp, or station. Initially he will enlist the efforts of the local civil authorities to remove such prostitution conditions.

2. If such local cooperative measures are not effective, the local commander will make written request to his appropriate

personnel at the specified post, camp, or station, the Secretary of War shall designate and publish in the War Department orders the specific area or areas adjacent to or a limiting zone around the post, camp, or station where it shall be unlawful to engage in prostitution or otherwise aid or abet same as described in the Act of Congress referred to above (A. G. 250.18 [3-12-41]).

This circular letter is obviously the due form in which the Army may cooperate with the intent of the May act. No mention of it is made in the Parran-Vonderlehr book or in the de Kruif exacerbation. Perhaps they did not know of it—perhaps the book had gone to the publisher before it was promulgated. However, the United States Public Health Service is a part of the Federal Security Agency. True the administrator, Mr. Paul McNutt, who is also Director of Defense, Health and Welfare Services, has issued a statement to the effect that he did not see the book until the day when the public release by Paul de Kruif appeared. Nevertheless, both the Administrator and Dr. Parran must have been familiar with a statement issued by the Adjutant General of the War Department on Oct. 2, 1941 (A. G. 353.8 [9-13-41] MB-A-M.) on the Establishment of the Division of Social Protection by the Federal Security Agency. "The first task of this Division



corps area commanders for a special report of prostitution conditions in the specific area adjacent to the post, camp, or station. Such requests will be referred to the Defense Regional Coordinator of the Federal Security Agency who, under existing arrangements, will cause a special investigation and report of conditions to be made. The Regional Coordinator's report when received by the corps area commander will be referred to the local military commander for his information.

3. If the Regional Coordinator's report transmitted through the corps area commander to the local commander contains factual information of the existence of prostitution, the local commander will again consult the local authorities, inform them of the general contents of the report, and advise them of the action in paragraph 4 which he will be required to take if the unfavorable conditions are not corrected.

4. If the local authorities fail to take corrective measures within a reasonable period of time after they have been informed of the content of the report, the local commander will forward a letter to the Adjutant General, through military channels containing the following:

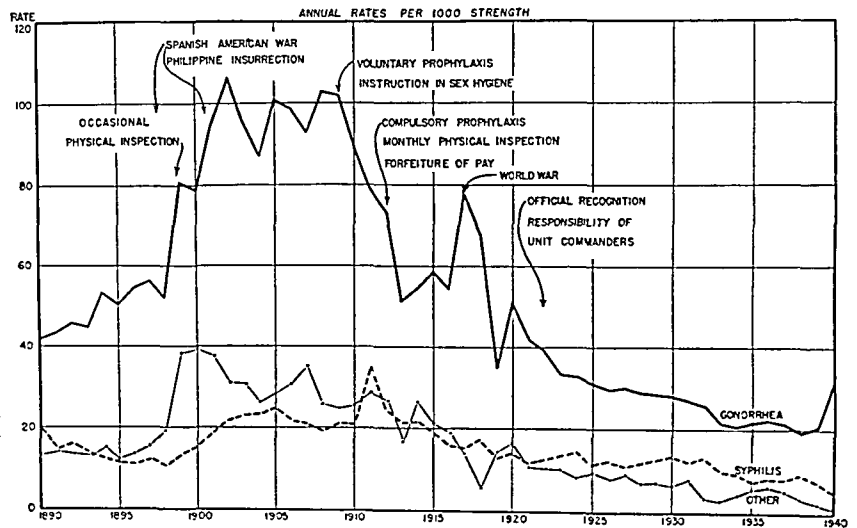
(a) A statement of prostitution conditions which are inimical to the efficiency, health and welfare of his command, based upon the Regional Coordinator's report.

(b) A narrative of the efforts which have been made to cause the local authorities to correct conditions.

(c) A recommendation as to the specific area or areas which the Secretary of War shall publicly announce.

5. If the report indicated in paragraph 4, together with other available information, indicates the existence of a condition harmful to the efficiency, health, and welfare of military

is to promote the public health by the reduction of venereal disease through the repression of commercialized prostitution" says this statement. The announcement (published in full elsewhere in this issue) is



epoch making in the principles it emphasizes and the technic it proposes. Most important is the following paragraph:

4. It is the policy of this Division to work through State and local authorities. It is the hope of those responsible for the administration of this program that the repression of commer-

cialized prostitution will continue as a *permanent policy* throughout this nation after this emergency is over. This can be accomplished only when State and local authorities and local communities are convinced that repression rather than toleration is the answer to the problem. It is, therefore, the responsibility of this Division to bring about the voluntary adoption of its program by local authorities as a permanent policy. The establishment by military authorities of areas as out of bounds for men in uniform, or the invocation of the May Act, are measures to be taken only as a last resort. Experience in the last war, and the attitude of Federal and local authorities to date in this emergency, all point to the likelihood that our program can be established in most defense areas on a voluntary basis.

This statement also both the Parran-Vonderlehr book and the de Kruif publicity ignore. Yet these official statements are far more in accord with the American tradition than that point of view which would federalize the pursuit of the prostitute in a program for the control of venereal disease. Indeed, this attitude toward more and more federal domination of state and local health activities becomes the focal point of this consideration.

If noninfected selectees are becoming infected, the matter is well worthy of public concern. But does the answer lie in more money to be spent on venereal diseases? The book emphasizes (p. 148) that "State expenditures for venereal disease control this year range from less than \$0.005 per capita in Nebraska to \$0.12 in Maryland." And the book continues (p. 149): "To do this job necessitates an increase of 75 per cent in present facilities, and at least \$10,000,000 annually in Federal funds, beginning now, to extend and improve work already begun against syphilis but which has hardly been started against gonorrhea."

When the de Kruif article was published and when Walter Winchell said over the radio on the same night that this scandal would shake many in high places, the dirty linen was tossed into the public laundry. The effect on the morale of the official personnel in many Washington bureaus was all that the scandal mongers might have hoped. For some days the gossips have been mouthing this morsel with relish. By the available evidence the charges were perhaps not too well founded, the situation not fully reflected, the remedies proposed—(a) continence for the soldier, (b) federal control of prostitution, (c) increased federal appropriations for venereal disease—none too certain in their curative effects and possibly harmful to the body politic.

Meanwhile the Army Medical Department, confident that it is exerting every effort to make its control program effective, lists this outline of its procedures:

(a) Physical examinations to prevent the induction into the service of selectees infected with venereal diseases.

(b) Education of the soldiers concerning the dangers of venereal diseases, and advice as to the desirability of continence.

(c) Provision of prophylactic facilities for those who expose themselves to the risk of infection.

(d) Regular monthly physical inspection of troops to detect infected individuals.

(e) Thorough treatment until all men who become infected are cured.

(f) Isolation of venereal disease patients during the infective stages.

(g) Disciplinary measures for soldiers who become incapacitated because of venereal diseases, unless innocently acquired.

(h) Cooperation with the Bureau of Medicine and Surgery, U. S. Navy; the U. S. Public Health Service; the Division of Medical Sciences, National Research Council; the American Social Hygiene Association, etc.

(i) The reporting to the responsible civil health authorities of known civilian sources from which soldiers are infected, in order that such sources may be traced and eliminated.

(j) The agreement with the U. S. Public Health Service whereby the latter, working through state and local agencies, has undertaken to eliminate civilian sources of venereal infection in extramilitary areas.

(k) The May law which can be invoked when—and preferably, as all leaders agree—only when existing civilian agencies responsible for the elimination of prostitutes in extramilitary areas fail to do so.

"Plain Words About Venereal Disease" tells of some plague spots—particularly in larger cities of the South and Southwest where segregated prostitution still prevails. The charge is made that 80 per cent of commanding officers are opposed to repression of prostitution and favor regulation (p. 109). Yet actual newspaper accounts from many areas show that many officers are taking their responsibility most seriously. Perhaps the nation as a whole is not too ready to cede more of its obligations to federal control.

ROENTGEN-RESISTANT VIRUS

The Shope papilloma virus is reported by Syverton¹ and his colleagues of the departments of bacteriology and radiology, University of Rochester School of Medicine, to be resistant to many thousand times the roentgen therapeutic dose necessary for cure of the cutaneous lesion that the virus produces in rabbits. Hornlike protuberances on the inner surfaces of the thighs, the back of the neck or other parts of the body are fairly common in wild rabbits; an occasional cottontail has the whole body covered with such "warts." The individual "horns" often reach a centimeter or more in diameter, with a height of 1.5 to 2 cm. In 1933 Shope,² of the Rockefeller Institute, reported that this cutaneous disease is readily transferred to wild rabbits by the application of glycerinated wart emulsions to slightly scarified cutaneous surfaces. The infective agent in such emulsions readily passes through the pores of a Berkefeld filter and exhibits other properties warranting its classification as an ultravirus. Rabbits with papillomas are partially or completely immune to reinfection, and their serums partially or completely neutralize the causative virus. Shope further found that, while the virus is readily transmissible in series in wild rabbits, it produces only nontransmissible first generation papillomas in domestic rabbits.

Interest in the Shope papilloma virus was heightened by the subsequent discovery³ that the nontransmissible warts in domestic rabbits often undergo progressive

1. Syverton, J. T.; Berry, G. P., and Warren, S. L.: *J. Exper. Med.* 74: 223 (Sept. 1) 1941.

2. Shope, Richard E., and Hurst, E. W.: *J. Exper. Med.* 58: 67 (Nov.) 1933.

3. Rous, Peyton, and Beard, J. W.: *J. Exper. Med.* 62: 523 (Oct.) 1935.

malignant changes, many of them eventually giving rise to metastases in regional lymph nodes, lungs and other internal organs. This is of practical clinical interest, since analogous instances of graded alteration from papilloma to cancer are frequent in human pathologic conditions. These secondary cancers are readily transplanted into a new rabbit host. There is immunologic evidence of the continued presence of the Shope virus in these cancers.⁴

Nontransmissible papillomas of domestic rabbits react to roentgen rays as noninfectious tumors. Syverton and his colleagues,⁵ for example, found that a continuous or interrupted exposure of these papillomas to 2,000 roentgens will cure 16 per cent of the lesions and that 2,500 roentgens will cure 33 per cent, 3,000 roentgens 66 per cent and 3,500 roentgens or more 100 per cent of all experimental lesions. Parallel in vitro exposures of cell-free Shope virus showed no demonstrable reduction in dosage or virulence until the dose had been increased to more than 2 million roentgens. At least 6 to 7 million roentgens is required for full inactivation. The cell-free suspension of the papilloma virus thus requires several thousand times the therapeutic dose for its sterilization.

Evidently "the curative effect of x-ray on domestic rabbit papillomas (Shope) results from the direct action of the roentgen radiation on the rabbits' cells rather than on the virus." Whether or not the virus is actually killed by the mildly roentgenized rabbit cells has not yet been determined by the Rochester investigators.

Current Comment

PHARMACOPEIA TRUSTEES ASSURE DIABETIC PATIENTS SAFE INSULIN

The board of trustees of the United States Pharmacopeia, meeting in New York in a special session on November 23, gave special consideration to the problem presented by the expiration of patents on insulin, which occurs Dec. 24, 1941. Heretofore all insulin manufactured in the United States and distributed to persons with diabetes has been subjected to standardization and assay both by the American manufacturers and by the Insulin Committee of the University of Toronto, which holds the patents. The Board of Trustees recommended to the Committee on Revision of the United States Pharmacopeia that standards and assays for insulin be made available at the earliest possible moment, so that the Food and Drug Administration in the Federal Security Agency, which is charged by the Food, Drug and Cosmetic Act with enforcing these standards, may apply the standards immediately on expiration of the insulin patents. Because of the special nature of insulin it is proposed that the two assay control which now prevails under the insulin patents be continued and that the Food and Drug Administration shall not release any product

for general sale or distribution until it is assured that the product meets the standards and assays which the United States Pharmacopeia will specify. It is reported that already several foreign manufacturers have shipped insulin to the United States with a view to its distribution just as soon as the patents expire. Such insulin, and all other insulin, will be controlled by the action taken by the Board of Trustees of the Pharmacopeia, cooperating with the Food and Drug Administration. Meeting simultaneously with the Board of Trustees was a specially appointed group of experts from the United States and Canada who will develop the standards and assays to be included in the Pharmacopeia. Thus diabetic patients will be protected against the possibility of using inefficient or toxic products.

MALIGNANT LESIONS OF THE STOMACH

Adequate information on such surgical aspects of malignant lesions of the stomach as the risks involved in efforts to remove gastric carcinoma, on the effectiveness of gastrectomy when this can be successfully performed and on the percentage of the total number afflicted with carcinoma for whom extirpation is feasible seems heretofore to have been largely lacking. With special emphasis on these questions, Walters and his colleagues¹ recently reported in *THE JOURNAL* a review of all cases of malignant lesions of the stomach seen in the years 1907 to 1938 at the Mayo Clinic. Fifty-eight per cent of the 11,000 patients for whom diagnosis of malignant lesion of the stomach was made at the clinic during these years were subjected to surgical exploration. The average mortality rate was 16 per cent in cases of gastric resection for malignant disease. Thus the risk of this surgical procedure has been comparatively low and the mortality rate has decreased progressively in recent years. In 45 per cent of this group (i. e. 26 per cent of the original group) the lesion was removed. The five year survival rate after resection was 29 per cent, the ten year survival rate was 20 per cent and the fifteen year survival rate was 15.2 per cent. Of patients who did not have extension or metastasis, 44.7 per cent lived five years after leaving the hospital. After patients on whom resection has been performed have survived a five year period, the survival rate closely approximates that of the general population of similar age groups. Significantly, approximately one third of the patients who had carcinomatous lesions of the stomach which were resectable had symptoms of the so-called ulcer type of dyspepsia. In four fifths of these a temporarily effective response, with relief of pain, occurred when the patient was placed on a medical ulcer regimen. The Rochester investigators conclude from this review that the operation of partial gastrectomy affords an excellent means of treatment of cancer of the stomach, with successful cures in a large percentage of cases in which there are localized lesions regardless of the degree of malignancy. The authors further conclude that medical treatment of an ulcer type of dyspepsia should not be instituted without a roentgenologic examination to determine the exact location and nature of the lesion.

4. Kidd, J. G.; Beard, J. W., and Rous, Peyton: *J. Exper. Med.* 64: 63, 79 (July) 1936.

5. Syverton, J. T.; Harvey, R. A.; Berry, G. P., and Warren, S. L.: *J. Exper. Med.* 73: 243 (Feb.) 1941.

1. Walters, Waltman; Gray, H. K., and Priestley, J. T.: *Malignant Lesions of the Stomach*, *J. A. M. A.* 117: 1675 (Nov. 15) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

MEDICINE AND SELECTIVE SERVICE

LEWIS B. HERSHEY

Brigadier General, U. S. Army; Director of the Selective Service System

Washington, D. C.

Everywhere I go I am under the necessity of thanking some one for a great deal, and it is true here. With 99 per cent of workers in Selective Service unpaid, it is necessary to be continually thanking some one. I do not possess control of the English language adequately to tell you what the work of anywhere from twenty thousand to fifty thousand of the medical profession of America—I am not counting the dentists—has done in the last year in Selective Service.

First I want to talk about the changes that are being made in the physical examination setup; second, I will mention rehabilitation; third, I want to thank you for what you are doing along these lines and beg you to keep on and perhaps to extend.

PHYSICAL EXAMINATION

The law says that the Army or the Navy shall be the final authority on the physical qualifications of the man. That has always been true. A year ago the Army did not feel quite as well organized as it does now to carry all of the responsibilities. Three years ago we planned a system not unlike the one we are going to attempt to use now. We had looked at the experience of a world war in which a quarter of a million people had been sent, many times, several hundred miles from home under the assumption that they were to be, in fact were, members of the armed forces of the United States, only to discover after a final physical examination in the camps that they did not possess the qualifications that the Army at that time insisted on. These men were dislocated from their businesses and from their homes. They were at some distance in time and in space thrown back to reallocate themselves. We realized that three years ago. But a year ago we were not able to get the Army to assume what we thought it should assume, namely to have the physical examination as near as possible to the place where the man lives and to have an examination that was—whether good, bad or indifferent—nevertheless final. After all, there is no perfection in this world. Perhaps there is no adequate physical examination; but we must agree that this is a physical examination and abide by the results of it.

In the World War the Army refused to permit the Selective Service System to say: This man has the qualifications for a soldier. I think it was the intent of the original Selective Service Law in 1917 that the determination was to be made at the local board as to whether or not the man did have the qualifications. If he did he was inducted and became from that time forth a soldier. But we have had the confusion over the years,

since the war, of the man who is discharged from the draft and the man who is discharged from the Army with some confusion as to the privileges that go with each.

We started out, however, with the dual examination. We tried to get the Army to bring its induction examination as near as we could in space to the place where the man lived, under the assumption that this at least would cut down the travel when he was rejected. We did not solve to suit us, or the public, the question of time. Many a man received his watch from the chamber of commerce, received the good wishes of his best girl, went to an induction station and found himself trying to get in rather quietly that night to his home town after having been rejected at the induction station. This was unfair to the man and unfair to the medical profession. Obviously the examining surgeon did his best and used his best judgment to try to determine whether that meat and bone and blood and hair added up to an individual who could be a soldier. Some other individuals of the same profession looked at it and said contrariwise. No one was wrong; both were right, but it was unfortunate that they disagreed.

We are trying to correct this situation. We are trying, if we can, to eliminate conflict between technical people, conflict that we understand but which the public does not understand. The public hangs on the words of the medical profession almost as it does on those of the priest. It believes the doctor more than it does the lawyer. When two doctors disagree it is unfortunate for the faith that the individual has in the profession. It is unfortunate for the profession that doctors are forced into a position where there may be some loss of faith. We hope the system we are going to start now will eliminate the time element and the conflict element.

THE SUPPLY OF PHYSICIANS

All that has been said during the past year on the necessity of deferment of doctors, of interns, of residents, of medical students and even of premedical students should make it unnecessary to speak about the need for physicians. If there is a scarcity of doctor hours in the United States there is no excuse for duplication of effort. Whenever there is a physical examination here that is absolutely going to be duplicated there it cannot be justified when each doctor hour is important. We have a right to try to have a physical examination that does not need to be duplicated either in paper work or otherwise. Many honest hours might be given to saving life that medical men have been obliged to spend in putting figures down somewhere that might be improperly interpreted and, even if prop-

early interpreted, would not lead to any action. Any time, any moment, any minute, any second we use in duplication is unwise. We are striving to try to make that which the medical examiner of the local board does complementary to what is being done later, rather than paralleling and duplicating.

THE SUPPLY OF MEN

We started with seventeen million five hundred thousand men, which seemed just lots and lots of men, but they have fallen out of the basket in one way or another. We do not have on hand as many as we should have with that large number. The fact that we are getting into somewhere near a shortage means that we must look over carefully the individuals we are rejecting.

I have no right to speak for the Army, but merely as one who has had some experience with it, and looking at it from the outside, I think it says "Here is an opportunity to have the healthiest Army any nation ever had." I think undoubtedly it has! I think it has a tendency to say "If there is any doubt about whether this man can pass or not, we will fail him." That is fine if there are enough men in the country to furnish the numbers wanted, but if the number is raised much from where it is now I fear we must depart from that. Hence we are tending to say to our medical examiners in this new method or modification of physical examination "You in the local board reject the man who is manifestly unfit for service. Where there is a question in your mind about whether he is unfit for service, record especially what you know about his emotional behavior patterns and forward it, and let the Army, which, after all, is by the act vested with the responsibility of deciding in what cases it wants to take the chance and in what cases it does not, from what it sees of the man and what it learns from what you have recorded, decide what it shall do with him."

CHANGE IN FORMS

We are trying to get a single form, which will be called 221, I think, that will be initiated by the local board and sent with the man to the examining station. We will have one complete record rather than too many incomplete records of form 200 here and form 221 there.

COMPENSATION FOR PHYSICIANS

There has been, perhaps because of misunderstanding and perhaps because of actual disagreement, much criticism of us, that we were trying to dump overboard ten or fifteen thousand doctors who had labored long and well. No such thing. I did feel and I do feel now that the doctors of America have put out, uncompensated, for Selective Service more than any other occupation. I do not believe we could expect to go on as we have in the last year, asking them to do this without compensation. I tell you frankly I don't want to try to operate Selective Service when we start on a pay basis, because the one thing that has kept us free from many undesirable things was the fact that we could get men who would work for nothing, who would not work for the wages the government could afford to pay. We have got something far beyond what you can hire at the wages we would expect to pay.

SERVICE OF PHYSICIAN ON DRAFT BOARDS

I would like to make the medical examiner of the local board something above some of the drudgery that has been imposed on him. I wish I could get the local boards to be able to have their medical examiner give

them more time in an advisory capacity. In this new change we look forward to a medical examiner as part of the board, not because he is going to do the examining, but because in hundreds of thousands of dependency cases, which involve 70 per cent of them, I find I have to have interpreted to me in a way I can understand a lot of the diseases of dependents. I should like to have these local boards have their medical examiner free enough so that he could say "That is what every 40 or 50 year old man has. Don't worry about that." Or say "He probably will die soon." But the words now supplied as reason for dependency might mean anything, from total disability to quite the contrary.

I would like to relieve the medical examiner as much as possible of the clerical work we have asked him to do. We have had some difficulty in interpreting what our form 200 means; I mention it with no criticism whatever. But these forms 200's are made in sixty-five hundred different places under at least ten thousand different circumstances. They go all the way from being made by kerosene oil and candle to the finest places one could have for examining. The individual examiners—some twenty thousand or more of them—look at life differently. When we try to equate what they have recorded on form 200 we doubt a little sometimes the validity because of the impossibility of supervising the environment under which the examinations have been made.

I believe that if form 221 is initiated in the local board and used to reject the man who is manifestly unfit, used to record everything known about the man who is either acceptable or at least on the borderline, these form 221's fabricated in a hundred places can be supervised to the place that they will tell a definite and believable story about the men who are examined.

Summarizing the examination, we want the manifestly unfit man rejected; we want the doubtful and the acceptable man forwarded. With rehabilitation coming on, we must put the Army on the spot with regard to the doubtful case to learn to what extent the man must be rehabilitated before the Army will accept him. Otherwise, if we commence to rehabilitate all of the individuals we think are rehabilitable we may have a difficult job trying to sell them to the Army.

REHABILITATION

The examiner of the future will, first, examine. Second, he will be recombining the registrants that have been rejected for individuals who, by reexamination, will prove they are fit for general service or who will be found to miss being fit for general service only by the degree that one can rehabilitate. He will be advising registrants as to what they should do to be rehabilitated, assisting many times as a community doctor in rehabilitating the individual and helping the local board and the state headquarters to exercise supervision in determining whether the man has been rehabilitated and in the, for us, rather difficult task of administering properly, efficiently and economically the fees connected with the rehabilitation. The advisory boards will, as they have in the past, tend to assist at times when the case seems a little beyond the capacity of the medical examiner.

The President decided that something must be done with regard to rehabilitation. Selective Service knew exactly who should do it—the Army. The Army wasn't so sure who should do it, but it knew exactly who shouldn't do it—the Army. At the end of the conference—I don't know whether it was because the Army

was a better salesman or what—we came away with a child we thought we had rather safely put in some one else's lap.

This question of rehabilitation is a large one; not only rehabilitation to the general service level or to the class B level but bringing men from the 20 to 40 per cent level, rehabilitating better citizens, without being soldiers, and rehabilitating members of the fair sex.

I am going to speak of rehabilitating individuals who are below the service level up to the service level. I shall not deal with rehabilitation up to the 1-B level. I shall not deal with rehabilitation from 20 to 40 per cent. The responsibility which the President put on us was attempting to push across the borderline the individuals who are hanging on the lower side of it. We feel that there are two or three hundred thousand individuals in that position.

We have asked the Army from now on, when it rejects a man, to say "Do you mean it or is he a person that could be brought up to the level if something was done to him?" Shortly we shall ask the local boards to go back over these lists and try to find for reexamination men who have had a high pulse or high blood pressure and perhaps nothing wrong with them except that they were frightened or even tried to be in that condition at the time they took the examination. We want the medical examiners to go back over these lists to find the individual who, by putting in a tooth or two, or something of that order, can be made a twelve-tooth soldier instead of a ten-tooth reject.

The first job is to take the individuals they are rejecting currently, second, to reexamine those who have some chance of becoming general service soldiers. These individuals will come back to the local board and, after consultation between the medical examiner of the local board and the man, will be given an opportunity, if he comes within the group we feel we can start with, to undertake rehabilitation at the expense, on a fee basis, of the United States in their local areas. Some of the individuals will accept it and some of them will not. We shall ask the Army to induct on a waiver those who do not. Otherwise, if there is no sting in the system I doubt seriously whether we shall accomplish much. If he accepts treatment, we visualize the individual being allowed to be doctored by the professional man he wants to choose. If he is too far away, we feel it is only fair to ask the registrant to pay his own way. We shall have to exercise some sort of control, especially over any physicians who may not do satisfactory work. We must have, after the job is done, approval by the local examiner or, if he needs help, by the medical advisory board, so that a selectee can be sent back to the Army for recheck and supposedly for induction. We must have help from the medical examiner and the medical examining board in taking care of the payment for these cases.

EDUCATION

You have been kind enough to listen to some of us at your national meeting. We do not want to be forward, but we would be glad to have that privilege continued. We hope next year in the summer, if it is reasonably cool and nice at Atlantic City, as I believe it will be, to bring an exhibit there. We understand that the American Medical Association, on occasion, speaks to a listening world of medical men. It might be that the time will come when we have words urgent enough that we might want you to say something in order to get them out, and get them out rapidly.

We shall be glad to give you information for the preparation of articles. We have no desire to send out canned information. We do want to be of assistance whenever we can remove doubt or misunderstanding.

We have had a very satisfactory arrangement during the past year. At your request we have sent people to participate in your state programs or, better still, you get our medical officer in your own state headquarters to take part. He knows more about the national picture than we do. He is no more confused, regardless of what you may think, and he knows a great deal more about what happens out in your state than we do. By and large, he ought to be a better man for you than any of us.

We do believe there might be, in the next two or three months, an excellent opportunity for joint meetings between the medical profession and the dentists in the several counties for consideration of the requirements of the Army and Navy. No one knows what day and hour the Navy may need some individuals by induction. We believe the question of rehabilitation, both medical and dental, will be something that most of these medical societies will be glad to know about.

FEES FOR REHABILITATION

I have two or three questions I shall raise. I should like to have any one give me the benefit of his information on what he thinks of the fees that the experience of the Veterans Bureau has developed for the treatment of different types of cases.

NEUROPSYCHIATRIC CASES

I should like to come on my knees, or any other way, to have the benefit of any one who may have experience on what to do about neuropsychiatric and alleged neuropsychiatric cases. I have had, for ten years and more, a definite interest in the peculiarities of human beings, especially as they keep an individual from being a good flier or a good driver of a tank or otherwise participating in modern war. No one has more sympathy than I have in the necessity for the Army to reject men who will not, under modern conditions, make soldiers, if we know what kind of individuals they are and if we know how to recognize them, and if we can instruct one hundred or two hundred men in that ability. It does not make much difference if one or two persons have that ability unless we can pass it on, because the decision has to be made in at least a hundred places. But I am frankly disturbed, and I have been brought to this point many times by talking with my medical examiners here and there over the country, when they say "I have known the boy since birth, and before, and I rather reject the idea that some one in Milwaukee or some other place in seven or eight minutes can find out things I have not been able to discover; with some knowledge of the human being and having made my living for forty years, or such a matter, practicing medicine, and thinking that, even though I am not an expert in that field, I rather reject the idea that some one can discover on such short notice that he possesses some of these disqualifying things."

I am frankly disturbed by the number of people turned down. I heard Dr. Abell speak this morning about the individuals who are not making the adjustment after they get to camp, and I am not surprised. Sometimes it does become a serious public relation when 40 per cent, as I know of in one place, of the people have been rejected because they presumably are

individuals who might become or were neuropsychiatric. If we get so that there are more than 51 per cent of that variety, I think the thing to do then is to have the kind of war that you can turn over to the majority, rather than expect the minority to wage it.

MEDICAL STUDENTS

The students are not by any right deferred. The law not only says they are not deferred but it says specifically that no class will be deferred. I think we have done very well by the medical student. We have done so well that sometimes I have actually been disturbed. But that is all right. I am perfectly willing, if for the greater good one must do the lesser evil. The local boards have been told that they may defer them, and "may" apparently was in capital letters because, by and large, they have. They have taken some who had been accepted for medical colleges and had not entered. I have the unfortunate task of trying to do something, after I get home, about a fellow who went to the wrong college. I don't know what the answer is going to be, but it isn't going to be right, whatever it is; I can assure you of that.

I am interested in protecting the medical profession, and I am perfectly willing to believe that all the things I have heard about the necessity for physicians are true. I am not so sure that we would do much better even if we had a law. We are faced continually, of course, not only with medical students but also with other students, chemists and a thousand other types of people.

I do believe you occupy a peculiar position in the minds of the people. I don't know whether you are going to kill the goose that lays the golden egg if you start the landslide on the other side. I don't know, but we shall continue regardless. The law would make

it easy for us. We could administer, we hope, easier than we could exercise judgment, but we have done much better than I expected. The only reason is that you have been pretty good salesmen. You still do have some of that combination that came from long ago when the medicine man was something a little more than a human being. May you continue to be.

I want to read a poem:

Ten little registrants standing in a line.
One joined the Navy, then there were nine.

Nine little registrants sitting on a gate.
One broke a vertebra, then there were eight.

Eight little registrants, talking 'bout heaven.
One went conscientious, then there were seven.

Seven little registrants, what a strange mix!
One became a pilot and then there were six.

Six little registrants very much alive.
One went and drowned and then there were five.

Five little registrants full of canny lore.
One stole a pig and then there were four.

Four little registrants, spry as they can be.
One became twenty-eight, then there were three.

Three little registrants, all alone and blue.
One fed his relatives, then there were two.

Two little registrants, what can be done!
One went to a psychiatrist, then there was one.

One little registrant classified 1-A.
Physically, mentally, morally okay.

One little registrant to tote a big gun.
He got married and then there were NONE!

ESTABLISHMENT OF DIVISION OF SOCIAL PROTECTION BY THE FEDERAL SECURITY AGENCY

According to a circular issued by the Adjutant General, October 2, the War Department has been advised by the Federal Security Agency of the recent establishment of a Division of Social Protection. The program of this new division follows. Copies of this program were sent by the Adjutant General's office to the commanding generals of all armies, army corps, corps areas and departments and the air force combat command, the chief of the armored force, the chief of the army air forces, the chief of staff, general headquarters and the commanding officers of exempted stations.

PROGRAM OF DIVISION OF SOCIAL PROTECTION

It is the purpose of the federal defense program to safeguard the health and morale of the armed forces and of the workers in defense industry. The Division of Social Protection has been formed to implement this purpose.

The first task of this division is to promote the public health by the reduction of venereal disease through the repression of commercialized prostitution.

The responsibility of the Division of Social Protection is by no means limited to this task, however.

The division is concerned with the protection of the community, and particularly of its girls and young women, from prostitution and other related social hazards. It also stimulates the constructive treatment and care of girls and women detained by the police.

In its long term aspects, this division is an integral part of the total public welfare program. It depends for its effective-

ness on the established agencies for public health, medical care, law enforcement, public assistance, recreation and child protection and in turn supplements these agencies in its particular field.

The program of the Division of Social Protection is summarized under four headings, relating to repression, treatment, protection and cooperation:

A. Repression of Commercialized Prostitution

1. The method adopted by the division toward the control of venereal disease is the repression of commercialized prostitution for the purpose of reducing to a minimum contacts by prostitutes with men in the armed forces and in defense industry.

2. While those interested in the program believe in its moral implications, the division considers it most important that the program be administered as a public health and protective measure without any suggestion of a moral crusade. One reason for this is the almost universal resistance of the citizenship of this country against governmental supervision of sexual morality. It may be that this resistance is allied to the fundamental American concept of religious liberty, since religion and morals are so closely associated. Just as the good citizen who is convinced of the importance of religion in human life may be strenuously opposed to any attempt by government to guide the practice of religion, so the good citizen while believing strongly that extramarital relations tend to destroy the values of family life may still be unwilling to see the federal government attempt to control such relations.

3. The program is unalterably opposed to any toleration of commercialized prostitution either in segregated districts or under medical supervision. This is based on experience and studies which have proved that segregation does not segregate

and that medical supervision alone cannot prevent the spread of venereal disease.

4. It is the policy of this division to work through state and local authorities. It is the hope of those responsible for the administration of this program that the repression of commercialized prostitution will continue as a permanent policy throughout this nation after this emergency is over. This can be accomplished only when state and local authorities and local communities are convinced that repression rather than toleration is the answer to the problem. It is therefore the responsibility of this division to attempt to bring about the voluntary adoption of its program by local authorities as a permanent policy. The establishment by military authorities of areas as out of bounds for men in uniform, or the invocation of the May act, are measures to be taken only as a last resort. Experience in the last war, and the attitude of federal and local authorities to date in this emergency, all point to the likelihood that our program can be established in most defense areas on a voluntary basis.

B. Treatment of Prostitutes

1. The aim of this program is to get local authorities to deal with the individual prostitute as a human being with the aim that those who are capable of rehabilitation can be helped back to ways of life which are more constructive.

2. Our field representatives will seek the establishment of facilities for the classification of girls and women picked up by the police so that those who can be helped can be separated from those who show little hope of rehabilitation, and so that those in need of special treatment can be given such treatment or sent to places where treatment is available.

3. Our field staff will seek provision of adequate facilities when needed for the treatment of women, on an individualized basis, whether that treatment is (a) medical, (b) custodial, (c) training, (d) placement in jobs, (e) placement in family foster homes, (f) assistance to return to their own homes or (g) other constructive measures.

C. The Protection of Girls in Defense Areas

1. Protection of girls in defense areas involves supervision of places of employment where (a) wages may be inadequate to meet the girls' minimum requirements for food and shelter and (b) where the girl employee may be subject to pressure to engage in prostitution as a consequence of her employment.

2. It likewise involves supervision of places of commercial recreation where girls may be in danger of being led into prostitution.

D. Cooperation with other Agencies

Those engaged in this program are well aware that this division is only one of many agencies whose work is necessary to bring about the desired results.

1. We do not attempt to work with the man in uniform, leaving his education with reference to social hygiene and the control of his actions to the military and naval authorities.

2. We are fully convinced of the importance of such positive action as the provision for recreation and other leisure time activities for the soldier and sailor but leave that to the military and naval authorities as supplemented by the Division of Recreation of this agency, by the USO and by many other interested agencies and organizations.

3. We are vitally concerned that persons with venereal disease receive prompt, effective and conclusive treatment so that they may first be made noninfectious and, second, cured, and we know that the U. S. Public Health Service is on that job.

4. In the field of law enforcement we depend on local authorities, the Military Police and, in the exceptional case, on the Department of Justice.

5. In the care of the apprehended prostitute and in the protection of girls and young women in danger of prostitution, we depend on the facilities and resources of the agencies of local, state and federal governments.

Conclusion

The Division of Social Protection, then, takes its place as an integral part of the Office of Defense Health and Welfare Services. On the state and local level it will maintain its responsibilities in a cooperative and constructive fashion, working with public officials, private agencies and interested citizens. It stands ready to modify its efforts and plans in accordance with new experiences and developing community needs. It is the will and desire of the American people to protect the health and morale of the men in its armed forces and defense industries. The Division of Social Protection will contribute to this end. We intend so to plan and execute the program that it will be accepted by the states and become the permanent policy of local government throughout this nation.

ELIOT NESS.

Director, Division of Social Protection.

GOVERNMENT STILL NEEDS PHYSICAL THERAPY AIDES

The U. S. Civil Service Commission is intensifying its recruiting efforts to secure physical therapy aides for the government service. About one hundred appointments were made in the last year, and it is expected that more than three hundred and fifty appointments will be made next year in the War Department and Veterans Administration. Positions are open ranging from the student grade to the full grade. Applications may be filed at any time at the commission's central office in Washington, D. C.

A new examination announcement—No. 24-revised—for physical therapy aide (\$1,800 a year) and junior grade positions (\$1,620 a year) has been issued which cancels and supersedes the announcement No. 24 issued January 20. The education and experience requirements remain substantially the same, but, in order to build up a reservoir of qualified people, applications will be accepted for these two positions from persons who do not meet the regular physical and age requirements. Such eligibles cannot receive regular probational appointment but may be considered for filling national defense needs. Applicants for probational appointment must not have passed their forty-fifth birthday. Persons who received eligible ratings under the examination announced in January need not file new applications unless they have acquired sufficient additional experience to warrant consideration for a grade higher than the one in which they were originally rated.

The examination announcements for physical therapy aide and the junior grade (announcement No. 24-revised) and for student and apprentice physical therapy aide (announcement No. 117 issued July 31) may be consulted or obtained at any

first or second class post office or at the Civil Commission, Washington, D. C. Persons who are interested in and qualified for physical therapy work are urged to file their applications at once.

ARMY HEALTH RATES ARE BETTER TODAY

The death rate in the Army from disease now is less than one-tenth what it was in the World War years of 1917-1918, and the venereal disease rate is less than half what it was in that period, the Surgeon General of the Army reported to the War Department on November 14. In 1917 the annual rate for all venereal diseases was 107 per thousand soldiers. In 1918 it was 90 per thousand. The present annual rate approximates 40 per thousand soldiers. The annual rate for syphilis in the Army has showed a consistent decline. In 1918, for instance, the rate was 17.56 per thousand. Progressively the rate dropped to 6.59 in 1939, 5.7 in 1940, and in August of this year it was 5.5. The August annual rate per thousand soldiers for all venereal disease was 43. Incidentally, Selective Service examination of prospective trainees showed that 45.2 men of every thousand were infected with syphilis.

The reductions not only in the death rates from disease but also the rates of venereal disease have resulted from an unrelenting campaign by the Army. Newer, more effective medical discoveries and methods have aided considerably. The campaign against venereal disease has brought intensified education in hygiene in the Army, which has recognized that the cooperation of civil authorities in the suppression of prostitution is essential to the suppression of venereal disease in the armed forces.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

WAR DEPARTMENT

The following additional medical reserve officers have been ordered to extended active duty by the War Department, Washington, D. C.:

BORKON, Maurice, 1st Lieut, West Kalispell, Mont
COCKE, John Alexander, 1st Lieut, Charlottesville Va
COLDWATER, Kenneth Bryson, 1st Lieut, St Louis
MEAGHER, George Beyer, 1st Lieut Depue, Ill
MENDEL, Walter H, Captain, Haverstraw, N Y
TRIPODI, Anthony, Lieut Colonel, St Louis

Orders Revoked

AHERN, Eugene E, 1st Lieut, Minneapolis
AUSTER, Benjamin, 1st Lieut, New York
CRAIG, Paul C, Captain Reading, Pa

DeWIRE Merrill B, Major, Reading, Pa.
DIAMOND, Bernard L, 1st Lieut, Ann Arbor, Mich
DINGMAN, Reed Othelbert, 1st Lieut, Ann Arbor, Mich
FAWCETT, Robert M, 1st Lieut, Pittsburgh.
FLANN, Vincent P, Captain, Pasadena, Calif.
HALE Clayton H, 1st Lieut, Manlius, N Y.
HANSEL, Robert J, Captain, Orlando, Fla
HOBART, Francis W, Captain, Lake City, Iowa
JARRETT, John T, 1st Lieut, Richmond, Va
KLINE, Edward M, Captain, Cleveland
LAUGHLIN, Victor C, Major, Cleveland
OVERTON, Lewis M, Captain, Des Moines, Iowa
RUDI, Herbert J, Captain, St Louis
TASCARELLA, James W, 1st Lieut, Brooklyn
WATNER, Amos S, 1st Lieut, Philadelphia

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

GARDINE William G Captain, Oteen, N C, Camp Gordon Ga
CORPENING, Albert Edward, 1st Lieut, Tampa, Fla, Camp Forrest, Tenn
METTETAL, Ray W, 1st Lieut, Johnson City, Tenn, Camp Gordon, Ga
REECE John Cochrane 1st Lieut Newton, N. C Fort Bragg, N. C
WINTERS, Allen C, Captain, Alexandria, La, Camp Gordon, Ga.

Orders Revoked

CARITHERS, Hugh A, Jr, 1st Lieut, Winder, Ga
CROOM, Arthur B 1st Lieut, Maxton, N C
GARRETT, Brook C, Captain, Shreveport, La
GESSLER, Carl N, 1st Lieut, McMinnville, Tenn
HAWES, James B, 1st Lieut, Greenville, N C
HUDSON, Harry Horatio 1st Lieut, Cleveland Tenn
HUNTER, William Blair, Major, Lillington, N C
PARNELL, Homer S, Jr, 1st Lieut, New Orleans
PITT, Charles K, 1st Lieut, Trinity, Ala
SAFELY, Thomas J, Jr, 1st Lieut, Drew, Miss
THOMAS, Ford Alton, Captain, Urania La
WILLIS, Charles A, 1st Lieut, Bambridge, Ga

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Michigan and Illinois:

ADLAND, Abe, Captain, Sioux Falls, S D, Reception Center, Scott Field, Ill
BULLOCK, Norman Charles, 1st Lieut, Rockford Ill, 1608th Corps Area Service Unit, Camp Grant Ill
CENEDELLA, Francis J, 1st Lieut, Moline, Ill, U S Army Induction Board, Peoria, Ill
FITZGIBBONS, James P, 1st Lieut, Chicago, Reception Center, Camp Grant, Ill
GRIEP, Ernst August 1st Lieut, Quincy, Ill, 64th Medical Regiment, Camp Bowie, Texas
GRIFFITH, Paul R, 1st Lieut Berwyn, Ill, 33d Division, Camp Forrest, Tenn.

HAUGE, Howard Leroy, 1st Lieut, Blanchardville, Wis, 23d Evacuation Hospital, Fort Custer, Mich
ISOE I M, 1st Lieut Chicago, U S Army Air Base, Tucson, Ariz
JACK Nelson Briggs, 1st Lieut, Decatur, Ill, Headquarters and Station Complement Camp Shelby Miss
LEES, William Morris, 1st Lieut, Chicago, U S Army Induction Station, Kalamazoo, Mich
MOORE, Rollin Samuel, 1st Lieut, Streator, Ill, U S Army Induction Board, Peoria, Ill
RITTER, Jerome, 1st Lieut, Danville, Ill, U S Army Induction Station, Kalamazoo, Mich
RESTIVO, Jack Liborio, 1st Lieut, Chicago, Richey Flying Service, Vernon, Texas
RUBINFELD, Samuel H, 1st Lieut, Ontonagon, Mich, Coleman Flying School, Ltd, Coleman, Texas
STOBBE, Godfrey Dorr, 1st Lieut, Detroit, Station Hospital, Savanna Ordnance Depot
WOLTERS, Simon Lloyd, 1st Lieut, Chicago, 1607th Corps Area Service Unit, Fort Sheridan, Ill

Orders Revoked

BARBER, Kent W 1st Lieut, Quincy, Ill
BERARDI, James B 1st Lieut, Dwight, Ill
BERGSTROM, Paul L, 1st Lieut, Kirkland, Ill
BICA, Getano A, 1st Lieut, Chicago 5th Infantry Division, Fort Custer, Mich
BLUEFARB Samuel M, 1st Lieut, Chicago
BORKON, Eli L, 1st Lieut, Carbondale Ill, Headquarters and Station Complement, Corps Area Service Command, Camp Davis, N C
BOWERS, Paul A, 1st Lieut, Chicago
BRAND Ashley M, 1st Lieut, Chicago
BROWN, Wilbert O, 1st Lieut, Chicago
CHABNER Louis, 1st Lieut, Shelbyville Ill
COHLER, Bernard E, 1st Lieut, Chicago
CONGER, April B 1st Lieut, Ann Arbor Mich
COVELL Kermit W 1st Lieut, Racine Wis
CUTRERA Hugo T, 1st Lieut, Chicago Army Air Base, Tucson, Ariz.
DEL BECCARO, Edward V, Major, Chicago
DICKERSON, Donald L, 1st Lieut, Danville, Ill
EMANUELE Nicola V, 1st Lieut Chicago
FLEMING, James F, 1st Lieut Chicago
FORTNER, Roscoe J, Captain, Three Rivers, Mich
GALL John H, Lieut Colonel Chicago
GUNDERSON, Robert H, 1st Lieut, Beloit Wis

HARLEY, Garth H, 1st Lieut Detroit
HERZOG, Paul S, 1st Lieut, Kenosha Wis
MARCHMONT ROBINSON, Harry, 1st Lieut, Chicago
O'BRIEN, Donald Erwin, 1st Lieut, Chicago, 1627th Corps Area Service Unit, Scott Field, Ill
LYNN, Harold Phillip, 1st Lieut, Ypsilanti, Mich, Headquarters and Complement, Camp Shelby, Miss
O'NEILL, Paul J, 1st Lieut, Alton, Ill, Corps Area Laboratory, Fort Sheridan, Ill.
PERKINS, Robert D, 1st Lieut, Moline, Ill
PORTS, Preston Wesley, Captain, Farmington, Mich, Station Complement, Selfridge Field, Mich
PRZYGOCKI, Stanley F, Captain, Chicago
ROKITA, Adam W, 1st Lieut, Barry, Ill
ROSENBERGER, Maurice D, 1st Lieut, Oak Park, Ill, 1605th Corps Area Service Unit, Fort Custer, Mich
SIBRANS, William Albert, 1st Lieut, East Detroit, Mich, Will Rogers Field, Oklahoma City
SLIVE Alexander, 1st Lieut, Chicago
SPRINGER, Eugene W, 1st Lieut, Iowa City
WINSAUER, Henry John, 1st Lieut, Kohler, Wis, Headquarters and Station Complement, Camp Shelby, Miss

ORDERED TO FOREIGN DUTY

CHAIHAN Alexander Robert, 1st Lieut, Medical Detachment, U S Troops Seward Alaska
DENEFF, Carl, 1st Lieut Hickam Field Hawaii
DISON, John Milnes 1st Lieut, Station Hospital Borinquen Field Puerto Rico

EMMERLING, John Frederick, Captain, Tripler General Hospital, Honolulu Hawaii
GILSDORI, Amos Roy, 1st Lieut, Station Hospital, Fort Richard on, Alaska

ORGANIZATION SECTION

OFFICIAL NOTES

THE ATLANTIC CITY SESSION

Section Representatives to Scientific Exhibit

Representatives to the Scientific Exhibit have been appointed from the different sections of the Scientific Assembly as follows

- Practice of Medicine—Louis B. LaPlace, 1900 Rittenhouse Square, Philadelphia
Surgery, General and Abdominal—Grover C. Penberthy, 1553 Woodward Avenue, Detroit
Obstetrics and Gynecology—Charles Edwin Galloway, 636 Church Street, Evanston, Ill.
Ophthalmology—Georgina Dorak Theobald, 120 Medical Arts Building, Oak Park, Ill.
Laryngology, Otolaryngology and Rhinology—Fred W. Dixon, 2060 East Ninth Street, Cleveland
Pediatrics—Arthur F. Abt, 104 South Michigan Avenue, Chicago
Experimental Medicine and Therapeutics—Dwight L. Wilbur, 490 Post Street, San Francisco
Pathology and Physiology—F. W. Konzelmann, Temple University Hospital, Philadelphia
Nervous and Mental Diseases—F. P. Moersch, 102 Second Avenue S. W., Rochester, Minn.
Dermatology and Syphilology—Hamilton Montgomery, 102 Second Avenue S. W., Rochester, Minn.
Preventive and Industrial Medicine and Public Health—Paul A. Davis, Akron, Ohio
Urology—John H. Morrissey, 40 East Sixty First Street, New York
Orthopedic Surgery—Jesse T. Nicholson, 1614 Locust Street, Philadelphia
Gastroenterology and Proctology—Grant H. Laing, 122 South Michigan Avenue, Chicago
Radiology—S. W. Donaldson, 326 North Ingalls Street, Ann Arbor, Mich.
Anesthesiology—Paul M. Wood, 745 Fifth Avenue, New York

Application blanks for space in the Scientific Exhibit at the Atlantic City session may be obtained from the section representatives or from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago

ABSTRACT OF MINUTES OF MEETINGS OF BOARD OF TRUSTEES HELD IN CHICAGO, NOV. 13 AND 14, 1941

A full day meeting of the Board of Trustees was held on Thursday, November 13, which was preceded by a full day meeting of the Executive Committee. The Board met again on Friday morning, November 14, to complete its deliberations and then adjourned to attend the Annual Conference of Secretaries of Constituent State Medical Associations.

WOMAN'S AUXILIARY

Wisconsin

The Rock County auxiliary cooperated with the Beloit Y. M. C. A. and seventeen other city, state and national organizations in presenting a "Hall of Health" exhibit patterned after those at the San Francisco and New York world fairs. The American Medical Association and the Wisconsin Women's Field Army for the Control of Cancer lent exhibits. A theater with movies, slides and plays including the highly praised film "Good-Bye Mr. Germ" was an outstanding feature. Among other cooperating organizations were Beloit College, the state board of health, the Wisconsin Anti-Tuberculosis Association, the American Museum of Health, the state medical association, the Beloit membership of the American Dental Association and many civic organizations.

The auxiliary to the Dane County Medical Society met at Cambridge and voted to appropriate \$50 to place Hygeia in

BINDING OF JOURNAL IN THREE VOLUMES A YEAR

Because of the growth of *THE JOURNAL* and the weight of the present volumes, it was decided to bind *THE JOURNAL* in three, instead of in two, volumes each year beginning with 1942.

DR. T. G. KLUMPP ELECTED TO MEMBERSHIP ON COUNCIL ON PHARMACY AND CHEMISTRY

Dr. T. G. Klumpp, Secretary to the Council on Pharmacy and Chemistry, was elected to membership on the Council.

REVISION OF STANDARDS FOR CLINICAL THERMOMETERS

The Board approved a revision of the standards for clinical thermometers established by the Division of Trade Standards, National Bureau of Standards, U. S. Department of Commerce, and reaffirmed the policy of the Association not knowingly to accept advertising for any product that does not comply with the standards of that bureau.

DR. WALTER E. VEST SUCCEEDS DR. E. J. GOODWIN ON COMMITTEE OF COOPERATIVE MEDICAL ADVERTISING BUREAU

Dr. Walter E. Vest, editor of the *West Virginia Medical Journal*, was elected to succeed Dr. E. J. Goodwin on the Committee of Cooperative Medical Advertising Bureau.

ASSOCIATION'S BROADCAST "DOCTORS AT WORK"

The Board approved plans for the continuation of the broadcasting program "Doctors at Work." These programs will be broadcast on Saturdays from 5:30 to 6 p. m., eastern standard time, on the Red network, beginning December 6, and will run approximately twenty-six weeks.

REPRESENTATIVE TO NATIONAL HEALTH COUNCIL

Dr. W. W. Bauer was designated to represent the American Medical Association on the Committee for the Study of Voluntary Health Agencies, which is being established by the National Health Council.

MISCELLANEOUS

Careful consideration was given by the Board to the financial reports for the current year, to plans covering certain phases of the Pan American Session of the Association to be held in 1942, to plans for the celebration of the Centennial of the Association in 1947, to resolutions and memorials referred to it by the House of Delegates at the last annual session and to numerous other subjects, some of which will be reported on at a later date.

schools chosen by the committee and also to donate \$20 to the loan closet to purchase needed articles. At a recent meeting held at the home of Mrs. N. A. Hill in Madison, thirty-eight members were present. The Hygeia chairman reported that four towns had accepted the offer to place Hygeia in their town libraries. Also the county nurses have assigned forty-eight schools in the county to receive the publication. It was reported that twenty lavettes had been purchased for use by the loan closet.

At the meeting of the auxiliary to the Waukesha County Medical Society recently in Waukesha, Dr. Irene Stumper of Oconomowoc spoke on "Women in Medicine."

In May, a President's Tea at the home of Mrs. H. G. Nixon Hartland, was held. George B. Larson, assistant secretary of the state medical society, gave an address on voluntary sickness insurance.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ALABAMA

Change in Health Officers.—Dr. John I. Mitchell, Haleyville, has been appointed health officer of Winston County, succeeding Dr. William A. Dodson Jr., Double Springs, who resigned to accept a position with the U. S. Public Health Service.

Society News.—The Northwestern division of the Medical Association of Alabama was addressed at Berry, October 21, by Drs. M. Vann Adams, Mobile, on "Treatment of Cerebral Complications in the Newborn"; John M. Townsend, Birmingham, "Surgical Management of the Ruptured Bladder and Urethra"; William D. Anderson, Tuscaloosa, "Indications for X-Ray Therapy in Everyday Practice"; Lee F. Turlington, Birmingham, "Endometriosis," and Edgar G. Givhan Jr., Birmingham, "Migraine."

CALIFORNIA

Officers of State Board.—Dr. Clark L. Abbott, Oakland, was recently elected president of the state board of medical examiners at a meeting in Sacramento and Dr. Fred R. DeLappe, Modesto, was named vice president to succeed Dr. George Thomason, Los Angeles. Dr. Charles B. Pinkham, San Francisco, was reelected secretary of the board for the twenty-eighth consecutive year.

Society News.—A panel discussion on "Trauma to the Hand" constituted the program of the Los Angeles Surgical Society at its meeting on November 14. The speakers were Drs. William S. Kiskadden, Joseph H. Boyes, Paul E. McMaster and Frank J. Breslin. All are from Los Angeles. —Dr. Axel N. Arneson, St. Louis, addressed a joint meeting of the radiologic section and the Los Angeles County Medical Association, November 6, on "Carcinoma of the Corpus Uteri." —Charles-Edward A. Winslow, Dr.P.H., Anna M. R. Lauder professor of public health, Yale University School of Medicine, New Haven, discussed "Health Problems of Defense" before the San Francisco County Medical Society on November 11. Dr. Winslow is now serving as Rosenberg lecturer in the public social services at the University of California, Berkeley.

Course of Instruction on the Cyclotron and Its Products.—The department of medicine of the University of California Medical School, San Francisco, announces an open course on the cyclotron and its products. The instructors are members of the staff of the University of California Radiation Laboratory in Berkeley. The course is given in recognition of the fact that the use of the cyclotron and its products has proved their worth and that they are ready for use in biology and medicine. The cyclotron was invented by Ernest O. Lawrence, Ph.D., professor of physics at the University of California, Berkeley, and head of the laboratory, and 1939 Nobel Prize winner, and development of the apparatus in medical and biologic research has been under the direction of Dr. John H. Lawrence, assistant professor of medicine at the medical school. The 225 ton "atom smasher" at the University of California is called the "medical cyclotron."

DELAWARE

State Medical Election.—Dr. William Marshall Jr., Milford, was elected president of the Medical Society of Delaware at its annual meeting in Wilmington, October 7. Other officers include Drs. Richard C. Beebe, Lewes, and Paul R. Smith, Wilmington, vice presidents; Alfred Leon Heck, Wilmington, treasurer, and Charles L. Munson, Wilmington, secretary. Dover was selected as the place for the 1942 session.

DISTRICT OF COLUMBIA

Davidson Lecturer Announced.—Dr. Robert J. Coffey, professor of experimental surgery, Georgetown University School of Medicine, Washington, delivered the Davidson Lecture for 1941 before the Medical Society of the District of Columbia on October 8. The Davidson lecturer is chosen on alternate years by a special committee, the selection going to the winner of an essay competition. Dr. Coffey's paper was entitled "Recent Advances in Diseases of the Pancreas." Dr. Coffey graduated at Georgetown in 1932. The Davidson Lecture was established in 1929.

ILLINOIS

Joint Session of Societies.—The sixty-seventh annual meeting of the District Medical Society of Central Illinois was held jointly with the Sangamon County Medical Society in Springfield on November 6. Speakers included:

Dr. Frederick F. Boyce, New Orleans, Basic Problems of Acute Appendicitis and Cancer of the Stomach.
Dr. Kenneth H. Schnepf, Springfield, Diaphragmatic Hernia.
Howard J. Shaughnessy, Ph.D., Chicago, Encephalitis of Virus Origin.
Dr. Burle B. Madison, Springfield, Nonspecific Infections of the Urinary Tract.
Dr. Fred M. Smith, Iowa City, Certain Aspects of the Treatment of Cardiac Failure.

Clinical Meeting of College of Physicians.—An annual roundup of all fellows and associates of the American College of Physicians of Illinois will form an all day meeting at the New Wesley Memorial Hospital, Chicago, on December 6. The program will include short papers and a clinical pathologic conference. In the evening brief addresses will be delivered by guests. The principal speaker of the evening will be Dr. Edward L. Bortz, associate professor of medicine, the Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania, Philadelphia, on "Medical Progress and the American College of Physicians."

Chicago

Annual Dinner of Institute of Medicine.—The twenty-sixth annual dinner and meeting of the Institute of Medicine of Chicago will be held in the Boulevard Room of the Stevens Hotel, December 2. Dr. Rollin T. Woodyatt will deliver the presidential address on "The Story of Acidosis."

Lecture on Beaumont.—Dr. Arno B. Luckhardt, professor of physiology, University of Chicago School of Medicine, will lecture under the auspices of the Robert Sonnenschein Study Group for Medical History at the Michael Reese Hospital, December 10, on "Dr. William Beaumont and the Medical Epic of the Northwest Territory."

Branch Meetings.—The North Shore Branch of the Chicago Medical Society will be addressed, December 2, by Drs. Howard A. Lindberg on "Up to Date Treatment of Pneumonia" and Edwin M. Miller, "Surgical Emergencies of the Newborn." —The North Side Branch was addressed, November 6, by Drs. Henry H. Turner, Oklahoma City, on "Fatigue States in Endocrine Disorders," and Elmer L. Sevringhaus, Madison, Wis., "Menopause and Hypofunction of the Ovaries."

New Cancer Committee.—The Chicago Cancer Committee, Inc., has been organized as a liaison educational agency; Dr. Ludvig Hektoen, executive director of the National Advisory Cancer Council, is chairman. The purpose is to disseminate information on the symptoms, diagnosis, treatment and prevention of cancer, to aid indigent cancer patients to obtain treatment and to work toward the establishment of hospital and other necessary facilities. Dr. William F. Petersen, chairman of the board of governors of the Institute of Medicine of Chicago, is treasurer of the committee; the directors include Dr. John A. Wolfer, chairman of the cancer committee of the Illinois State Medical Society; Dr. Bowman C. Crowell, associate director of the American College of Surgeons; Mrs. Arthur I. Edison, state commander of the Women's Field Army of the American Society for the Control of Cancer, and Mr. Alexander Ropchan, director, health division, Council of Social Agencies, secretary.

IOWA

Society News.—Dr. Louis J. Karnosh, Cleveland, will discuss "Psychiatric Problems in General Practice" before the Linn County Medical Society, December 11, in Cedar Rapids. Dr. Arlie R. Barnes, Rochester, Minn., conducted a clinic on cardiac cases before the society November 13. —Dr. Rolland Russell Best, Omaha, discussed "Causes of Continued Disability Following Cholecystectomy: Management" before the Chickasaw County Medical Society in New Hampton, November 5. —Dr. Lloyd H. Mousel, Rochester, Minn., addressed a recent meeting of the Cerro Gordo County Medical Society in Mason City on "Recent Developments in Anesthesia."

New Members of Fifty Year Club.—Dr. Ferdinand J. E. Smith, Milford, was presented with a plaque by the state medical society in recognition of his completion of fifty years in the practice of medicine. Certificates of membership in the "Fifty Year Club" of the state medical society were awarded to the following members of the Polk County Medical Society in October: Drs. Andros Carson, Des Moines; Jared D. Kerlin, Des Moines; Ellis G. Linn, Des Moines; David T. Nicoll, Mitchellville; Christian Nysewander, Des Moines, and Fred L. Wells, Des Moines.

MARYLAND

Society News.—The Baltimore City Medical Society and the Medical Society of the District of Columbia held a joint meeting in Baltimore, November 7; the speakers were Drs. Hugh H. Hussey Jr. and James Ross Veal on "Treatment of Thrombophlebitis"; Worth B. Daniels, "Epidemic of Bronchopneumonia of Unknown Etiology," and Clarence K. Fraser and John L. Parks, "Lesions of the Vulva." All were from Washington.

Dr. Howard Kelly's Library.—The Howard A. Kelly Library, said to be one of the largest private collections in the country, is being sold in separate items, newspapers reported, November 4. In explaining the reason for the disposal, Dr. Kelly, professor emeritus of gynecology, Johns Hopkins University School of Medicine, Baltimore, is reported to have said "I want to be sure that my books will get into good hands." Dr. Kelly has given collections to various units of Johns Hopkins University, including a group dealing with the life and times of Florence Nightingale to the school of nursing and one on geology and Africa to the Homewood Library of the university. He also gave an extensive mycologic collection known as the Louis C. C. Krieger Mycological Library to the University of Michigan, Ann Arbor. Dr. Kelly began his book collection in 1885.

MICHIGAN

First Award of Foster Welfare Foundation Prizes.—The first award of the prizes for papers on medical research by the Foster Welfare Foundation of Grand Rapids were made at a dinner, October 28. Drs. John T. Hodgen and Charles H. Frantz are winners of the \$100 prize offered for Blodgett Memorial Hospital for their paper on "Juvenile Kyphosis." This paper also won the grand prize of \$100. Dr. Henry P. Kooistra is winner of the prize for the staff of St. Mary's Hospital for his work on "Pilonidal Sinus—Review of the Literature and Report of 350 Cases." The three winners this year are all graduates of the University of Michigan Medical School, Ann Arbor. The creation of these awards was announced last year. They are available to the staffs of the Blodgett Memorial Hospital, St. Mary's Hospital and Butterworth Hospital, all of Grand Rapids, under the Foster Welfare Foundation of Grand Rapids, founded under the will of the late Clara J. Foster of Newaygo. The conditions stipulated that three \$100 cash prizes will be awarded, one for each of the hospitals named, to the author or authors of the best medical paper written by a member of the staff of the hospital, provided the staff of such hospital produces at least five medical papers, including the winning paper, which have been accepted for publication by either a national or a state medical journal during the year commencing May 1, 1940 and ending May 1, 1941. The Kent County Medical Society named the committee of three to judge the papers, representing each hospital, and Charles Judson Herrick, Sc.D., Grand Rapids, professor emeritus of neurology, University of Chicago School of Medicine, Chicago, cooperated with the faculty of the University of Michigan Medical School in judgment of the papers.

MISSOURI

Dr. Koch Lectures in St. Louis.—Fred C. Koch, Ph.D., formerly Frank P. Hixon distinguished service professor and chairman of the department of biochemistry, University of Chicago, Chicago, lectured at the St. Louis University School of Medicine, St. Louis, October 24, on "Recent Biochemical Studies on Androgens."

Society News.—Bradley M. Patten, Ph.D., Ann Arbor, discussed "Development of the Cardiovascular System with Micro-Moving Pictures of Living Embryos" before the Kansas City Academy of Medicine November 21.—Dr. Lawrence D. Thompson, St. Louis, presented a review of the incidence and therapy of pneumococcal pneumonia before the St. Louis County Medical Society on October 8 in St. Louis.

NEW JERSEY

Public Health Meeting.—The New Jersey Health and Sanitary Association will hold its sixty-seventh annual meeting at the Stacy-Trent Hotel, Trenton, December 5. Dr. John L. Rice, health commissioner of New York City, will deliver the principal address, on "Changing Trends in Public Health."

Annual Fall Clinical Conference.—The Medical Society of New Jersey will hold its fourth annual fall clinical conference in Elizabeth, December 3. The morning will be given over to special sessions in various industrial plants. At Elizabeth General Hospital there will be during the entire morning a presen-

tation of cases from the department of malignant and allied diseases and discussion of diagnosis and treatment. The afternoon will be devoted to papers sponsored by the sections of the society:

Dr. Henry C. Barkhorn, Newark, Tonsillectomy by Eversion and Snare.
Dr. Hyman I. Goldstein, Camden, Ulcer and Cancer of the Stomach, Through the Ages.
Dr. Edward C. Klein Jr., Newark, Circulation Time and Venous Pressure: Procedure for the General Practitioner.
Dr. Robert A. MacKenzie, Asbury Park, Ovarian Tumors Complicating Pregnancy.
Dr. Albert S. Harden Jr., Maplewood, Breast Feeding, Its Uses, Production and Preservation.
Dr. Harry J. Perlberg, Jersey City, Radiology in Obstetrics.
Dr. Elmer P. Weigel, Plainfield, Compound Fractures.

Dr. Edward G. Bourns, Westfield, will be the toastmaster at the dinner in the evening, and Johannes Steel, radio commentator, will discuss "World Conditions: A Realistic Appraisal."

NEW YORK

Symposium on Cancer.—The Nassau County Cancer Committee sponsored a symposium on gastric cancer before the Nassau County Medical Society in Garden City, October 28. The speakers were Drs. Fred W. Stewart, New York, pathology; Robert P. Ball, New York, x-ray diagnosis, and Ashley W. Oughterson, New Haven, Conn., surgery.

Society News.—Dr. Henry van Zile Hyde, New York, medical officer, second defense area, addressed the Onondaga County Medical Society, Syracuse, October 7, on "The Health Defense Program," and Dr. Edgar M. Neptune, Syracuse, presented a motion picture on "Treatment of Hip Fractures."

—Dr. Bertram S. Levinson, Syracuse, presented a paper before the Syracuse Academy of Medicine, October 21, on "Laboratory and Clinical Observation on 100 Ambulatory Cases of Hypertension" and Drs. Joseph Ernest Del Monico and Charles C. Heck, Syracuse, presented a motion picture on "Fracture of the Patella: Treatment by Excision."—Dr. Leon H. Griggs, Syracuse, addressed the quarterly meeting of the Ontario County Medical Society, Canandaigua, October 14, on "Diseases of the Skin."—Dr. Felix Ottaviano, Oneida, discussed "The Paraffin Pack in the Treatment of Pulmonary Tuberculosis" before the Oneida Medical Society, Oneida, recently.

New York City

Doctors Orchestra Starts Rehearsals.—The Doctors Orchestral Society has resumed its weekly rehearsals at the National Hospital for Speech Disorders under the direction of Mr. Fritz Mahler as conductor. The annual concert will be given at Town Hall on May 8, 1942.

Dr. McGregor to Retire from Teaching.—James H. McGregor, Ph.D., a member of the zoological staff of Columbia University since 1897 and, since 1924, professor of zoology, has announced his decision to retire next year. In recognition of his many years service the Pre-Medical Society of Columbia will give a testimonial banquet to Dr. McGregor at John Jay Hall on the Columbia campus, December 12.

Smallpox on Ship from African Ports.—The American-South African liner *City of New York* arrived in the New York port, November 13, with 1 case and 1 suspected case of smallpox in members of its crew. Vaccinations were started at once on the 82 crew members and 52 passengers. The 2 cases were to be removed to the Marine Hospital on Staten Island for treatment. The last case of smallpox brought into New York by ship was in 1939; another was by ship in 1937. The last locally developed case in New York was in 1932. Contacts in the recent outbreak who are residents of New York City when released by the U. S. Public Health Service will be examined daily by a department of health physician for twenty-one days. Arrangements will be made for similar supervision by local authorities for contacts wherever they go.

Medical-Dental Convention.—The eleventh annual medical-dental convention, arranged by the Joint Committee of the Organized Medical and Dental Professions of the City of New York, will be held at the Hotel Pennsylvania on December 1. Speakers will include:

Dr. Morris L. Rakiety, Bacteriophage in the Treatment of Infections of the Head and Neck.
Grace MacLeod, Ph.D., Vitamins and Diet.
Dr. Louis W. Schultz, Chicago, Treatment of Subluxation of the Cervical Joint.
Dr. [illegible], medical director, Selective Service, Wash-
ington, Aspects of Selective Service.
C. Raymond Wells, D.D.S., dental director of Selective Service, Wash-
ington, Dental Aspects of Selective Service.

There will also be a symposium on "Diagnostic Significance of Head Pains" with Drs. Joseph D. Kelly, Byron P. Stookey and Henry S. Dunning as the speakers.

NORTH CAROLINA

District Meetings.—The Sixth District Medical Society was addressed recently in Raleigh, among others, by Drs. Jerome S. Harris, Durham, on "Recent Advances in Sulfonamide Therapy" and Herman Max Schiebel, Durham, "Diagnosis and Treatment of Acute Surgical Diseases of the Upper Abdomen."—Speakers before the Ninth District Medical Society in Statesville recently included Drs. Frank B. Marsh, Salisbury, on "The Plasma Protein—Its Physiology Relative to the Normal and Failing Circulation."

Canadians Study School Health Service.—Three officials of the province of Quebec, Canada, visited in North Carolina recently to study the state school health coordinating service with the view of establishing a similar activity in Quebec. They were Hon. Henri Groulx, Pharm.D., minister of health and social welfare, Quebec and Montreal; Dr. Jean Gregoire, Quebec, deputy minister of health for the province and president of the Canadian Public Health Association, and B. O. Filteau, deputy minister of education. The visitors conferred with Dr. Walter E. Wilkins, Raleigh, state school health coordinator; Dr. John F. Kendrick, Raleigh, of the Rockefeller Foundation, adviser to the service, and others. Conferences were also held with Dr. Carl V. Reynolds, Raleigh, state health officer, and with health and education officials in Greensboro and Goldsboro. The North Carolina School Health Coordinating Service is a project of the state board of health and the state department of public instruction.

Society News.—Dr. Charles J. Andrews, Norfolk, Va., addressed the Tri-County Medical Society of Washington, Martin and Tyrrell counties at Plymouth, September 24, on "The Nausea of Pregnancy."—Dr. James F. O'Neill, Winston-Salem, addressed the Forsyth County Medical Society, Winston-Salem, September 9, on "Infusion of Blood and Other Fluids into the General Circulation by Way of the Bone Marrow Cavities."—Dr. Thomas B. Mitchell, Shelby, among others, addressed the Thermal Belt Medical Society in Shelby, October 16, on "Effective Therapy in Chronic Alcoholism."—Drs. Robert H. and Margaret E. L. Owen, Canton, discussed "Oophorhagia" (ovarian hemorrhage) before the Haywood County Medical Society in Waynesville recently.—Dr. Mark A. Griffin, Asheville, addressed the Buncombe County Medical Society, Asheville, October 6, on "Chronic Alcoholism" and Dr. Julian A. Moore, Asheville, October 20, "Regional Ileitis."

OHIO

The Farm Security Medical-Health Program.—The medical-health program of the Farm Security Administration was in operation in forty-four counties in Ohio, August 30, with about three thousand farm families participating and between six hundred and seven hundred physicians rendering services, the state medical journal reports. The so-called pooled plan is in operation in each county, the funds being contributed by FSA clients participating in the program from money borrowed from the federal government under the farm rehabilitation program. The average annual amount paid by each participating family is about \$22.

Society News.—Dr. William J. Dieckmann, Chicago, addressed the Summit County Medical Society, Akron, October 7, on "Management of the Toxemias of Pregnancy."—Dr. Richard B. Cattell, Boston, addressed the Butler County Medical Society, Middletown, recently, on "Diagnosis and Management of Lesions of the Large Bowel."—Dr. Charles D. Aring, Cincinnati, addressed the Montgomery County Medical Society, Dayton, October 3, on "Polyneuritis."—Dr. Charles E. Howard, Cincinnati, addressed the Stark County Medical Society, Massillon, September 10, on "Proctology as Related to General Practice."—Drs. George Crile Jr. and Allen Graham, Cleveland, addressed the Trumbull County Medical Society, Warren, recently, on "Diagnosis and Treatment of the Jaundiced Patient" and "Clinical Versus Pathological Malignancies" respectively.—Dr. Stanley Milton Goldhamer, Ann Arbor, Mich., addressed the Mahoning County Medical Society, Youngstown, recently, on "Diagnosis and Treatment of the Anemias."

PENNSYLVANIA

Society News.—The Lycoming County Medical Society conducted its annual clinic meeting at the Lycoming Hotel, Williamsport, November 14; speakers were Drs. Carl E. Ervin, Harrisburg, on "Early Diagnosis of Carcinoma of the Stomach"; Clayton T. Beecham, Philadelphia, "Early Diagnosis of Cancer of the Urogenital Tract"; Stanley P. Reimann, Phila-

delphia, "Experiments on Cell Division," and Roscoe W. Teahan, Philadelphia, "Considerations on the Early Diagnosis of Cancer."

Annual Postgraduate Day.—The Harrisburg Academy of Medicine will hold its annual postgraduate day in Harrisburg, December 2. Speakers and their subjects will be:

- Dr. Frank H. Lahey, Boston, Diseases of the Stomach, Duodenum and Jejunum; Modern Developments in Thyroid Disease.
- Dr. James L. Poppen, Boston, Diagnosis, Management and End Results in Herniations of the Intervertebral Disk; Diagnosis and Treatment of Brain Tumors—A Problem for the General Practitioner.
- Dr. Gilbert E. Haggart, Boston, Chronic Low Back Pain and Sciatica; Problems in Fracture Treatment.
- Dr. Elmer C. Bartels, Boston, Diagnosis and Operative and Non-operative Treatment of Hypertension; Some Medical Problems: Management of Obesity, Management of Addison's Disease, Diagnosis and Treatment of Gout.

Philadelphia

Society News.—The November 12 meeting of the Philadelphia County Medical Society was designated "Clinical Pathology Night"; speakers were Drs. Russell Richardson on "Interpretation of Clinical Laboratory Methods Useful in the Diagnosis and Treatment of Diabetes Mellitus"; William P. Belk, Wynnewood, Pa., "Clinical Pathologic Methods Useful in the Diagnosis, Classification and Prognosis of Bright's Disease," and Herbert Fox, "Value of the Tissue Biopsy to the Clinician, Radiologist and Pathologist."—The Philadelphia Laryngological Society was addressed, November 4, among others, by Dr. Edward H. Campbell on "Impressions of the Labyrinth Fenestration Operation for Deafness Gained from Three Years' Experience."—Drs. James P. Quindlen and Robert C. McElroy, among others, addressed the Obstetrical Society of Philadelphia, November 6, on "Management of Dead Abdominal Pregnancy."—Dr. Brooke M. Anspach, among others, spoke before the Philadelphia Rheumatism Society, November 6, on "Role of Gynecologic Disorders in the Production of Arthritis."

Appointments to Woman's Medical College.—Dr. Edward J. G. Beardsley, clinical professor of medicine, Jefferson Medical College of Philadelphia, has been appointed professor and head of the department of medicine at Woman's Medical College of Pennsylvania, and Dr. Benjamin Tertius Bell has been named professor and head of the department of orthopedics. Other new appointments to the faculty include:

- Dr. Clara L. Davis, Lansdowne, Pa., clinical assistant professor of medicine.
- Dr. Mary H. Easby, clinical assistant professor of medicine.
- Dr. Katherine A. Elsom, Narberth, Pa., clinical assistant professor of medicine.
- Dr. John P. North, clinical professor of surgery.
- Phyllis Bott, Ph.D., associate professor of physiologic chemistry.
- Dr. Eula Eno, associate professor of obstetrics.
- Dr. Yvonne M. Turk, clinical assistant of gynecology.
- Dr. Claire Miller, clinical assistant of pediatrics.
- Dr. John E. Eicholz, clinical assistant of psychiatry.
- Dr. Frederick Jardon, clinical assistant of psychiatry.
- Dr. Elizabeth M. Johnson, clinical assistant of psychiatry.
- Dr. J. Hamilton Allan, clinical assistant professor of orthopedics.
- Dr. Frank S. Clarke, clinical assistant professor of radiology.
- Dr. Sylvia A. Mazer, clinical assistant of urology.
- Dr. Ruth F. Harral, assistant professor of anesthesia.

New departments of anesthesia, gastroenterology and urology have been established under the following professors: Drs. Julia H. Hardin, professor of anesthesia; Mary M. Spears, professor of gastroenterology and proctology, and Faith Fetterman, professor of urology. Dr. Carmen C. Thomas has been promoted to be professor and head of the department of dermatology and syphilology. The hospital has been reorganized with Dr. Eno as medical director, and a new system has been introduced for residencies offering graduate work in medicine, pediatrics, surgery and gynecology.

SOUTH CAROLINA

Personal.—Martin D. Young, Columbia, has been appointed director of the Malaria Research Laboratory at the South Carolina State Hospital, Columbia, which is under the direction of the U. S. Public Health Service. He succeeds the late Bruce Mayne, Dr.P.H., *Science* reports.

Changes in Health Officers.—Dr. John M. Bearden is the new health officer of Laurens, succeeding Mr. L. M. Price, effective August 15.—Dr. Robert D. Hicks, Chester, has been named director of the Chester County Health Department, succeeding Dr. Walter G. Crawley Jr., Lancaster, who has been dividing his time recently between Chester and Lancaster counties, it is reported.

TEXAS

Change in Meeting Place.—The State Medical Association of Texas announces that the 1942 annual session will be held in Houston, May 11-14, instead of Corpus Christi as was previously announced. According to the state medical journal, the change was made on account of the lack of cooperation of the Robert Driscoll Hotel management in Corpus Christi.

Society News.—Dr. Jay C. Crager, Beaumont, addressed the Jefferson County Medical Society in Beaumont, September 8, on "Aviation Medicine."—Drs. Simeon H. Hulsey, Fort Worth, and Thomas M. Jarmon, Tyler, addressed the Hunt-Rockwall-Rains Counties Medical Society, September 9, on "Bronchial Asthma in the Aged" and "Common Problems in Diagnosis in Urology" respectively, and Dr. Neil D. Buie, Marlin, president of the State Medical Association of Texas, discussed "Medical Personnel and the American Medical Association."—Dr. Samuel R. Snodgrass, Galveston, discussed "Herniation of Intervertebral Disks" before the Jefferson County Medical Society in Port Arthur, October 13.

WISCONSIN

Lectures by Latin American Minister of Public Health.—Dr. Juan César Mussio-Fournier, minister of public health, Uruguay, S. A., and director of the Institute of Endocrinology, Pasteur Hospital, Montevideo, Uruguay, spoke before the University of Wisconsin Medical Society, Madison, October 23. The titles of the lectures were "Local Action of Hormones" and "The Importance of Studying the Development of the Dental and Osseous Systems in Hypothyroid Infantilism."

Annual Dearholt Day.—The second annual "Dearholt Day" was observed in Madison on November 11 under the auspices of the Wisconsin Anti-Tuberculosis Association, the University of Wisconsin Medical School and the Dane County Medical Society. Lectures were delivered by Dr. Esmond R. Long, professor of pathology, University of Pennsylvania School of Medicine, and the director of the Henry Phipps Institute, Philadelphia, and Dr. Kendall Emerson, managing director of the National Tuberculosis Association, New York. Dr. Long spoke on "Some Correlations of the Pathology and Epidemiology of Tuberculosis" and "The Roles of Environment, Nutrition and Constitution in Tuberculosis" and Dr. Emerson on "The Doctor's Duty as a Citizen" and "Voluntary Health Agency and the Physician." The special observance is held in honor of the late Dr. Hoyt E. Dearholt, Milwaukee, for many years executive secretary of the Wisconsin Anti-Tuberculosis Association.

GENERAL

Noise Abatement Group Chooses Officers.—William Reynolds, New York, was elected president of the National Noise Abatement Council at its annual meeting in New York on October 24, succeeding George P. Little, Chicago. Other officers elected include W. L. Manning, Chicago, vice president; G. L. Bostwick, Chicago, treasurer, and F. Edgar McGee, Buffalo, executive secretary. At this meeting the council announced a year round program for communities throughout the country to reduce unnecessary noise in homes, offices, industries and public places. Heretofore activities of the council have centered around local noise abatement week campaigns conducted in various communities during June.

Academy of Dermatology and Syphilology.—The fourth annual meeting of the American Academy of Dermatology and Syphilology will be held at the Waldorf-Astoria Hotel, New York, December 14-18. Special lectures will be delivered by the following guest speakers:

- Dr. Perrin H. Long, Baltimore, Clinical Use of the Sulfonamide Compounds.
- Dr. Jesse Bedford Shelmire, Dallas, Texas, Diagnosis and Treatment of Weed Dermatitis.
- Dr. Vicente Pardo-Castello, Havana, Cuba, Diseases of the Nails.
- Dr. Cornelius P. Rhoads, New York, Newer Knowledge Concerning the Chemical Causation of Cancer.
- Dr. Edward Loebholz, Philadelphia, Physiology of Pigmentation.

Symposiums and their leaders include: Avitaminoses, Dr. Paul Gross, New York; physiology and chemistry, Dr. Donald M. Pillsbury, Philadelphia; allergy, Dr. Samuel M. Peck, New York; syphilis, Dr. Udo J. Wile, Ann Arbor, Mich., and pharmaceutical therapeutics, Dr. Otto H. Foerster, Milwaukee. There will be special courses on histopathology, mycology, roentgen ray and radium therapy and photography, and many round table discussions covering various aspects of dermatology and syphilology.

New Fellowships in Nutrition.—Swift & Company, Chicago, has announced the establishment of a series of fellowships for research in nutrition. Intended to aid the federal government in its long range national program in nutrition, the fellowships provide for special research to be undertaken in laboratories of universities and medical schools with funds set aside by Swift & Company as grants in aid, beginning on November 1. The fellowships will be for one year but may be renewed when the project warrants it. Any fundamental study of the nutritive properties of foods or the application of such information to improvement of the American diet and health will be eligible for consideration for a grant. Placement of the new fellowships will be coordinated by R. C. Newton, Ph.D., and his staff of the Research Laboratories of Swift & Company, Union Stock Yards, Chicago.

Syphilis Drops with Compulsory Marriage Test Laws.—A survey by the Council of State Governments in sixteen of twenty-six states where couples planning to marry must first take blood tests shows a reduction in the syphilis rates, it was reported on October 9. The survey reported a rate of 1.28 per cent in the group taking premarital examinations. A recent estimate by the American Social Hygiene Association that the syphilis rate among the nation's adult population during the period 1935-1940 was 3.24. In making the survey, six states which have adopted premarital laws this year and four others in which these laws have been enforced for comparatively short times were excluded. According to the report, Connecticut recorded an over-all reduction from 2,494 cases in 1936 to 1,903 in 1940. Positive cases among applicants for marriage licenses in Rhode Island declined from 1.6 per cent in 1938 to 1.1 per cent in 1939 and to 0.9 per cent from July 1, 1940 to June 30, 1941. Transmission of syphilis has occurred in as many as 60,000 cases a year in the United States, according to the survey. Between 1935 and 1940 1.69 per cent, or 4,791 cases in a total of 282,667 mothers examined, showed evidences of the disease, figures of the social hygiene association revealed. Most of the antepartum blood test laws require that the tests be made within thirty days of the first medical examinations and several specify "at the same time of the first examination." Only about one third of the antepartum blood test laws provide penalties for avoidance, and few require treatment to follow positive results, so that the measures now in effect are mainly educational, it was pointed out. According to the survey of the Council of State Governments, however, positive examinations usually bring the mother back for treatment.

CORRECTION

The National Nutrition.—In the first paragraph of the letter to the editor by Dr. Logan Clendening in THE JOURNAL, September 20, page 1035, the first word in the fourth line should have been "health" instead of "wealth," and the reference to *Technology Review* in the sixth line should have been to the June 1940 issue instead of to the August 1940 issue of that periodical.

Government Services

Advisory Committee on Care of Children

An advisory committee on the daytime care of children has been set up under the Children's Bureau, U. S. Department of Labor, Washington, D. C., to work out an adequate program to care for children whose mothers are employed in defense work. The committee is composed of social workers, health officials, pediatricians, educators, nursery school people and experts in day nursing, newspapers reported. Subcommittees also are at work devising standards for procedure in day nurseries, nursery schools and recreation centers for this age level. The findings of these committees will be passed along as recommendations to state and local agencies. The creation of the committee was announced during the recent meeting of the American Public Health Association in Atlantic City by Dr. Martha M. Eliot, associate chief of the Children's Bureau. Mothers in defense industries will be able to work more efficiently, it is believed, knowing that their children are receiving proper supervision and care while they are away. Some of the important items to be developed include a well balanced feeding program, proper health supervision for these centers, and more intelligently supervised play in the day nurseries. Consideration will also be given to recreation centers for school children to fill in the gap between the time when school is out and their mothers return from work, it was said.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 11, 1941.

Food Supplies Under the Lend-Lease Act

The Ministry of Food states that the total supply of food likely to come to Britain under the lend-lease act will constitute only some 5 or 6 per cent of our total consumption, but its value is more than these figures suggest. It includes concentrated proteins, such as cheese, canned milk, dried milk, eggs, canned fish and canned meat. The canned milk forms a considerable proportion of our total supply. Food distribution is carried out by wholesalers to whom the government sells. The Ministry of Food exercises a close control over all profits, so that neither wholesalers nor retailers receive more than is adequate to cover their services. The whole price level is stabilized by the government. In the case of certain necessities, such as bread, they provide a subsidy to prevent the price rising above a certain level. The price of the more important foods is controlled, and no food received on lend-lease terms will be sold at uncontrolled prices.

Mr. Paul H. Appleby, United States Undersecretary of Agriculture, who is in this country, stated in a press interview that America was sending to Britain as much canned pork of high quality as had ever been produced there in a single year. Britain was taking a quantity of evaporated milk equal to America's former total production and dried milk in excess of the former production. Of dried eggs the quantity was a thousand times the total previous output, and the contribution of shell eggs would be 7.5 per cent of the total output of a thousand million hens. Previously America imported cheese, but now Britain was to receive 45 per cent of America's annual output. Other commodities to be sent included canned tomatoes, dried beans, fish, oils, oranges, a great quantity of lard, dried fruits and a fourth of America's salmon.

International Scientific Conference on Postwar World Order

A scientific international conference is to be held in London to demonstrate the common purpose of men of science in ensuring a postwar order in which the maximum benefits of science will be secured for all people. Among those who will preside at the sessions are the American ambassador, Mr. Winant, the Soviet ambassador, M. Maisky, the Chinese ambassador, Mr. Wellington Koo, the president of Czechoslovakia, Dr. Benesh, Mr. H. G. Wells and the president of the British Association for the Advancement of Science, Sir Richard Gregory. The conference is being organized by the British Association's division for social and international relations of science. At the end Sir Richard Gregory will put forward a new charter of scientific fellowship. Czechoslovakia, Poland, Norway, the Netherlands, Belgium and France will be represented, and exiled scientists from Germany, Austria and possibly Italy will also take part. The conference will seek to define the part which science can play in helping to secure the best use of the possibilities of the twentieth century and to make practical contributions to the solution of problems.

Anglo-Soviet Medical Cooperation

The inaugural meeting of an Anglo-Soviet medical committee was held at the rooms of the Medical Society of London. The committee has the support of the leaders of the profession, including Sir Charles Wilson, president of the Royal College of Physicians, Sir Frederick Gowland Hopkins, past president of the Royal Society, Sir Philip Manson-Bahr and Prof. J. A.

Ryle. Support has been promised by the medical branches of the navy, army and air force. Sir Alfred Webb-Johnson, president of the Royal College of Surgeons, who was elected president of the committee, said that the medical profession in this country had been intensely interested in the colossal experiment in environmental and social medicine carried out in the Soviet Republic. M. Maisky, the Soviet ambassador, said that victory in this war and peace in the future largely depends on close cooperation between Britain and the Soviet Union. He had a warm spot for the medical profession, as his father was an army doctor and his brother was also a doctor and was now in charge of a hospital. Lieutenant General Hood, director general of medical services at the War Office, said they would there welcome as much information as they could get on the medical services of the Russian forces.

The Diagnosis and Treatment of Cancer

The state in Great Britain plays a greater and greater part in the treatment of disease. At first public health legislation was confined to particular classes of the community: mothers, young children and children of school age. Then the state created organizations for the treatment of particular diseases: tuberculosis, venereal diseases and, last of all and quite recently, cancer. In 1939, just before the war, the cancer act was passed in order to ensure the earlier diagnosis and treatment of cancer. There was need for it, as many cases reached an advanced stage before diagnosis was made or adequate treatment was available. A deputation from the Royal College of Surgeons presented a memorandum to the minister of health pointing out the need for early and accurate diagnosis, increased facilities for the training of radiotherapists and the establishment of a national cancer institute. The cancer act makes provision for the diagnosis and treatment by requiring local health authorities to submit to the minister of health arrangements which secure in their areas adequate facilities for these purposes. The facilities for treatment include surgery, radium and high voltage roentgen therapy. The patients may be dealt with either in the present voluntary hospitals or in hospitals maintained by the local authorities. The outbreak of war caused the minister of health to postpone until March 1942 the coming into force of the act. This extension of time was given because of the burden of additional work thrown on the local authorities by the war. A further extension to March 1943 has now been granted, as the minister recognizes that in general it is not possible for the local authorities to make complete arrangements at the present time. But he emphasizes the importance of providing facilities for expert diagnosis and skilled treatment of all who are suffering from or suspected to be suffering from cancer.

In view of the necessity of reserving the capital and material resources of the country for works of strategic importance, local authorities are told to exclude from their interim arrangements the erection of new buildings, elaborate extensions to existing buildings or the provision of costly new equipment. But the minister considers that much can be done, even under present conditions, by extending facilities for the diagnosis and treatment of cancer; e. g., by making agreements with hospital authorities having the requisite staff and equipment, by payment of traveling expenses when necessary and by making known to the public the facilities thus provided. In some of the especially vulnerable areas, conditions may be reducing or impeding the hospital facilities available to cancer sufferers, who may thus be precluded from obtaining the treatment likely to benefit them. To counteract this the minister is endeavoring to arrange for the establishment of cancer treatment centers at certain of the hospitals in the emergency hospital scheme outside the towns which they would serve. Arrangements should be made for the transfer to them of suitable patients.

Prof. A. J. Clark—A Great Pharmacologist

The death of A. J. Clark, F.R.S., professor of materia medica in the University of Edinburgh, after an operation at the age of 56, has removed an eminent pharmacologist. Educated at Cambridge and St. Bartholomew's Hospital, he at once turned his attention to pharmacology, of which he became demonstrator at King's College, London, and lecturer at Guy's Hospital. He joined the Army Medical Service in the last great war and received the military cross for gallantry and devotion to duty. After the war he was successively professor of pharmacology at Cape Town, University College, London, and Edinburgh University. He was a member of the Medical Research Council and pharmacologic adviser to the *British Medical Journal* for twenty years. He was author of many important books, of which "Applied Pharmacology" reached a seventh edition. Others were "Comparative Physiology of the Heart," "Mode of Action of Drugs on Cells" (an original work which gained him a high reputation in other countries) and "General Pharmacology." Sir Henry Dale, president of the Royal Society, describes Clark's principal aim as "interpreting the actions of drugs in more fundamental terms." In a small popular book entitled "Fact," there appeared in 1938 from his pen the most authoritative exposure of so-called patent medicines since the British Medical Association published "Secret Remedies." He showed that the annual turnover of the trade in patent medicines was about \$100,000,000, which is nearly equal to the cost of hospital services and between twice and three times the cost of drugs prescribed by physicians. About one sixth of the advertising space in journals was devoted to nostrums. The revenue derived by periodicals from this can be imagined from the fact that eight firms which advertised remedies for nervous and digestive disorders spent \$5,000,000 annually, and a company which advertises a brand of acetylsalicylic acid stated that they proposed to spend nearly this sum in three hundred papers. When the British Medical Association issued "Secret Remedies," containing analyses, costs and the like, not only was it not noticed editorially by most papers but advertisements of it were declined by many.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 29, 1941.

Bureau of Aviation Sanitation

The national health department has petitioned the ministry of the interior to establish within the division of river and ocean sanitation a bureau of aviation sanitation. Airplanes which land in Argentina fly, in part, over extensive infected regions, where insects may easily be acquired as unwanted passengers. Besides, air passengers themselves might be infected. Aviation has greatly increased within recent years. In 1938, 771 airships carried 7,328 passengers in Buenos Aires; in 1940, 1,762 air vessels conveyed 15,845 passengers. It must also be taken into account that the period of incubation does not run its full course during the short time the passengers are on board.

Brief Reports

Prof. Dr. José Arce, professor of clinical surgery at the faculty of medicine in Buenos Aires, has resigned to devote himself completely to the study of thoracic surgery.

Dr. Delfor del Valle Jr. was appointed professor of clinical surgery at the faculty of medicine of the University of Buenos Aires to succeed Prof. R. Armando Marotta, who retired. Dr. del Valle is chief of the department in the Ramos Mejia Hospital; together with two other section heads he organized the Instituto Gastroenterología.

The Asociación Argentina para el Progreso de las Ciencias has granted a stipend to Dr. Enrique A. Viacava, assistant at

the surgical clinic of the university, which is to enable him to study the surgical treatment of cancer at the Memorial hospital in New York.

The Pan American Sanitary Bureau, in cooperation with the Rockefeller Foundation for Argentina, has provided seven stipends, which are distributed by B. A. Houssay, professor of physiology. A total of thirty-five such stipends have been planned for South America. The stipendiaries are to be attached for one year to hospitals in the United States, to extend their training.

To combat infectious abortion among cattle, Argentina has introduced certification, which is required for import as well as for export. This is to prevent the consumption of infected meat by human subjects.

A newly founded branch of the Asociación Médica Argentina is the Sociedad de Medicina Industrial in Buenos Aires. Its task is to study the dangers to the health of the worker created by fatigue, lack of cleanliness, use of toxic substances, illumination, and so on.

In July the Argentine Red Cross arranged for the shipment of food to British prisoners in Germany. The shipment consists of four hundred and eighty boxes weighing in all 22,000 Kg. The international Red Cross in Geneva will take care of the distribution. In the same manner French prisoners of war of Germany are to receive 18,400 pounds. The means for these shipments were provided by the British and French colonies in Argentina.

Society News

The American Institute for the Protection of Infancy met in Montevideo, Uruguay, under the chairmanship of Dr. Gregorio Aráoz Alfaro. Dr. Felix Brunot, delegate of the Unión panamericana, Dr. Justo González, director of the Oficina sanitaria and Miss Catharina F. Lemroot, head of the U. S. children's bureau, were among those present. To secure the cooperation of several international institutions is one of the leading objectives.

The Pan American League for the Control of Cancer will meet in 1942 in Buenos Aires. According to Francis Carter Wood of Columbia University, seventeen American countries are members of this league. A Pan American center for tuberculosis statistics is to be created. Prof. Angel H. Roffo is its president.

Deaths

Prof. Dr. Pedro Rojas, professor of embryology and histology at the faculty of medicine in Buenos Aires and director of the same institute, died on July 7 at the age of 54. He had published a book on the structure of the myocardium.

Prof. Faustino J. Trongé, who had done much for the development of obstetrics in Argentina and who was greatly esteemed in the United States, died at the age of 71 in Buenos Aires.

Dr. Pílares O. Dezeo, professor of Hygiene in the faculty of medicine in La Plata, died in Buenos Aires.

Marriages

SUMPTER WRIGHT HAWKINS, Fort Smith, Ark., to Miss Jane Elizabeth Bleiler of Mount Holly, N. J., at Abington, Pa., October 25.

RICHARD CABOT NAILING, Union City, Tenn., to Miss Marie Eleanor Dempsey of Centralia, Pa., in Boston, September 30.

JAMES E. REEDER JR., Sioux City, Iowa, to Miss Adella Gordon Badgerow of Daytona Beach, Fla., July 30.

MARCUS B. EMMONS to Miss Lillian Ha Draper, both of Iowa City, in Eldora, Iowa, August 26.

MYRON HENRY BALL, Scranton, Pa., to Dr. GLADYS FRIED of Dupont, September 7.

AARON COBLENTZ to Miss Rebecca Tauber, both of New York, October 5.

Deaths

Paul Stilwell McKibben, Ph.D., since 1931 dean and since 1929 professor of anatomy at the University of Southern California School of Medicine, Los Angeles, died, November 11, at the Good Samaritan Hospital, aged 55, following gastric resection for a malignant ulcer at the pylorus. Dr. McKibben was born in Granville, Ohio, March 14, 1886 and graduated from Denison University in Granville in 1906. He received his Ph.D. degree at the University of Chicago in 1911, where he was an assistant in anatomy from 1908 to 1911, an associate in anatomy 1911-1912 and instructor in anatomy 1912-1913. From 1913 to 1927 he was professor of anatomy at the University of Western Ontario Medical School, London, Ont., Canada, and dean from 1919 to 1927, and was associate professor and professor of anatomy at the University of Michigan Medical School, Ann Arbor, from 1927 to 1929. During the World War Dr. McKibben served as first lieutenant in the Army Sanitary Corps and did research work on brain injuries for the Rockefeller Institute for Medical Research and Johns Hopkins University. He was a member of the American Association for the Advancement of Science, the Royal Society of Canada, the American Association of Anatomists and the Society for Experimental Biology and Medicine and the History of Science Society. The University of Western Ontario granted him the degree of doctor of laws in 1928 and Denison University conferred on him the honorary degree of doctor of science in 1936.

George Albert Hendon ♂ Louisville, Ky.; Louisville Medical College, 1894; Hospital College of Medicine, Louisville, 1898; an Affiliate Fellow of the American Medical Association and member of the House of Delegates from 1928 to 1931; professor of surgery at Hospital College of Medicine from 1895 to 1908; professor of surgery at University of Louisville School of Medicine from 1908 to 1923, clinical professor of surgery from 1923 to 1934, head of the department of surgery, 1928-1929, and professor emeritus since 1938; surgeon, Louisville City Hospital and St. Anthony's Hospital; member of the Southern Surgical Association; fellow and one of the founders of the American College of Surgeons; aged 70; died, October 26, of cerebral hemorrhage and arteriosclerosis.

Max Mailhouse ♂ New Haven, Conn.; Yale University School of Medicine, New Haven, 1878; clinical professor of neurology emeritus at his alma mater; president of the Connecticut State Medical Society, 1915-1916; secretary of the state examining board from 1893 to 1900; member of the American Psychiatric Association and the Association for Research in Nervous and Mental Disease; past president of the National Association for the Study of Epilepsy; aged 84; died, October 19, of arteriosclerosis.

Wesley Franklin Kunkle, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of the State of Pennsylvania; past president, secretary and librarian of the Lycoming County Medical Society; for many years school physician; for many years president of the Lycoming County Tuberculosis Society and director of the Pennsylvania Tuberculosis Society; on the staff of the Williamsport Hospital; aged 77; died, October 26, of cerebral hemorrhage.

Louis Klein ♂ Nutley, N. J.; Long Island College Hospital, Brooklyn, 1906; member of the Michigan State Medical Society; in 1935 was appointed director of clinical research of the firm of Hoffmann-La Roche, Inc.; held a similar position with Parke, Davis & Co. in Detroit, where he was on the medical staff of Harper Hospital and was consulting endocrinologist to the Wayne County Juvenile Court; aged 56; died, October 24, at his home in Upper Montclair of coronary thrombosis.

Guy Walter Luckey ♂ Austin, Texas; Barnes Medical College, St. Louis, 1907; director, local health services, Texas State Department of Health, and field director, division of county health units; at one time health officer in Bernalillo County and Albuquerque, N. M., and health officer of Boone County, W. Va.; formerly assistant city health officer, Fort Worth, Texas, and director, division of local health services; aged 58; died, October 30, of cerebral hemorrhage.

William David McDowell, Las Animas, Colo.; College of Physicians and Surgeons, School of Medicine of the University of Illinois, 1901; instructor in medicine from the collegiate year 1901-1902 through the collegiate year 1906-1907 at his alma mater; member of the Illinois State Medical Society;

formerly on the staffs of the Garfield and Bethany hospitals, Chicago; aged 79; died, October 13, in the Colorado State Hospital, Pueblo, of senility.

William Sigismund Branner ♂ New Paltz, N. Y.; Medico-Chirurgical College of Philadelphia, 1906; health officer for the village of New Paltz and town of Plattekill; examining physician for the local draft board; on the courtesy staffs of the Kingston City and Benedictine hospitals, Kingston, St. Luke's Hospital, Newburgh and St. Francis and Vassar hospitals, Poughkeepsie; aged 66; died, October 26, of acute myocarditis.

Harry Cushman Willett ♂ Des Moines, Iowa; Rush Medical College, Chicago, 1894; member of the American Academy of Dermatology and Syphilology; on the staffs of the Broadlawn County Hospital, Iowa Methodist Hospital, Iowa Lutheran Hospital and Mercy Hospital; consultant in dermatology, U. S. Veterans Administration; aged 71; died, October 17, in Chevy Chase, Md., of coronary thrombosis.

Karl Albert Connell ♂ Scarsdale, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1900; at one time professor of surgery at the Creighton University School of Medicine, Omaha; served during the World War; fellow of the American College of Surgeons; formerly chief surgeon of the Presbyterian Hospital, Omaha; aged 63; died, October 18, of heart disease.

William Thomas Morrissey ♂ New Britain, Conn.; College of Physicians and Surgeons, Baltimore, 1909; member of the American Academy of Ophthalmology and Otolaryngology; past president of the Hartford County Medical Society; served during the World War; served the New Britain General Hospital in various capacities; aged 59; died, October 23, of coronary thrombosis.

Mark Tad Morgan ♂ Captain, M. C., U. S. Army, retired, Dayton, Ohio; Ohio State University College of Medicine, Columbus, 1929; entered the medical corps of the United States Army as a first lieutenant in 1930 and in 1932 was made a captain; retired for physical disability Aug. 31, 1940; aged 39; was found dead in October at Middletown of carbon monoxide poisoning.

John Joseph Lynch, Washington, D. C.; Georgetown University School of Medicine, Washington, 1925; member of the Medical Society of the District of Columbia; instructor in clinical obstetrics and clinical gynecology at his alma mater; aged 43; died, October 25, of cerebral hemorrhage, arteriosclerosis and essential hypertension.

Joseph A. Lafferty, McKees Rocks, Pa.; Cleveland-Pulte Medical College, Cleveland, 1913; member of the Medical Society of the State of Pennsylvania; served during the World War; on the staff of the Ohio Valley General Hospital; physician for the county draft board; aged 52; died, October 13, of coronary occlusion.

John Julius La Roche Jr., Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1911; member of the South Carolina Medical Association; associate professor of medicine at his alma mater; aged 53; on the staff of the Roper Hospital, where he died, October 12, of cerebral arteriosclerosis.

Frank Joseph Donigan, Brooklyn; Long Island College Hospital, Brooklyn, 1921; member of the Medical Society of the State of New York; assistant visiting surgeon on the staff of the Coney Island Hospital and associate visiting surgeon at the Caledonia Hospital; aged 43; died, October 19, of coronary thrombosis.

John Franklin Downing, Muncie, Ind.; Medical College of Indiana, Indianapolis, 1897; member of the Indiana State Medical Association; formerly county coroner; served during the World War; on the staff of the Ball Memorial Hospital; aged 67; died, October 18, of chronic nephritis and arteriosclerosis.

Louis Daniel Retz, Walton, N. Y.; Syracuse University College of Medicine, 1920; member of the Medical Society of the State of New York; on the staffs of the Wyckoff Heights Hospital and Bushwick Hospital, Brooklyn; aged 44; died, October 23, of cerebral hemorrhage, arteriosclerosis and hypertension.

William Irenaeus Armstrong, Bellaire, Ohio; Ohio Medical University, Columbus, 1904; member of the Ohio State Medical Association; aged 65; died, October 20, in the Ohio Valley General Hospital, Wheeling, W. Va., of subdural hemorrhage due to cerebral arteriosclerosis.

John Arthur Alvarez ⊕ Houston, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1930; fellow of the American College of Physicians; on the associate staffs of St. Joseph's Infirmary and the Hermann Hospital; aged 36; died, October 19, of fibrosarcoma of the chest wall.

Claude Alphonsus Savage, Fort Wayne, Ind.; University of Louisville School of Medicine, 1922; member of the Indiana State Medical Association; formerly county jail physician; aged 48; for many years on the staff of St. Joseph's Hospital, where he died, October 11, of coronary thrombosis.

Harvey G. Bloom, Oxford, Ind.; Miami Medical College, Cincinnati, 1895; member of the Indiana State Medical Association; formerly county coroner; aged 71; died in October at the St. Elizabeth Hospital, La Fayette, of benign hypertrophy of the prostate and cardiovascular disease.

Reuben Harold Stiehm, Madison, Wis.; Indiana University School of Medicine, Indianapolis, 1926; associate professor of clinical medicine at the University of Wisconsin Medical School; aged 40; was found dead, October 21, of acute dilatation of the heart.

Walter W. Voight ⊕ Chicago; Christian-Albrechts-Universität Medizinische Fakultät, Kiel, Prussia, 1904; fellow of the American College of Surgeons; attending gynecologist, St. Joseph's Hospital; aged 62; died, October 25, of coronary thrombosis.

Grant S. Van Horn, Batavia, Ohio; Eclectic Medical Institute, Cincinnati, 1894; member of the Ohio State Medical Association; for many years member of the school board; aged 73; died, October 16, in the Christ Hospital, Cincinnati, of uremia.

Robert Drysdale May ⊕ Jacksonville, Fla.; Emory University School of Medicine, Atlanta, Ga., 1917; served during the World War; a member of the local draft board; aged 48; died, October 6, in St. Vincent's Hospital of coronary sclerosis.

Paul Dawson Hanley, Pottstown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1912; member of the Medical Society of the State of Pennsylvania; on the staff of the Pottstown Hospital; aged 55; died, October 23, of uremia.

John Wiley Ruckman ⊕ West Liberty, W. Va.; Eclectic Medical College, Cincinnati, 1910; was college physician for the West Liberty Teachers College; aged 56; died, October 4, in the Ohio Valley Hospital, Wheeling, of coronary thrombosis.

James Russell Young, Pocatello, Idaho; Western Reserve University School of Medicine, Cleveland, 1917; member of the Idaho State Medical Association; fellow of the American College of Surgeons; aged 53; died, October 13, of appendicitis.

Robert Bayard Touchstone, Lytle, Texas; Memphis (Tenn.) Hospital Medical College, 1903; member and vice president of the State Medical Association of Texas; bank president; aged 65; died, October 11, of cerebral hemorrhage.

Charles Edwin Meckstroth, New Knoxville, Ohio; Starling-Ohio Medical College, Columbus, 1914; member of the Ohio State Medical Association; aged 56; died, October 20, in St. Rita's Hospital, Lima, of cerebral embolism.

Robert Russell King, Lancaster, N. Y.; University of Buffalo School of Medicine, 1931; member of the Medical Society of the State of New York; aged 33; died, October 15, in the Buffalo General Hospital of bronchopneumonia.

Albert D. Christian, Ottawa, Ill.; Northwestern University Medical School, Chicago, 1893; member of the Illinois State Medical Society; aged 73; died, October 20, in Mesa, Ariz., of injuries received when struck by an automobile.

Herman Ernest Doege ⊕ New Rochelle, N. Y.; Baltimore University School of Medicine, 1901; aged 63; on the staff of the New Rochelle Hospital, where he died, October 24, of peritonitis and ruptured diverticulum of the sigmoid.

Edgar Rae Frankish, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1904; L.R.C.P., L.R.C.S., Edinburgh, Scotland, 1905, and L.F.P.S., Glasgow, 1905; aged 61; died, October 23, of cerebral hemorrhage.

Carl Thomas Arrington ⊕ Oklahoma City, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1930; served during the World War; aged 43; died, October 18, of an accidental overdose of sleeping tablets.

Max Peter Schranck, Twin Falls, Idaho; State University of Iowa College of Medicine, Iowa City, 1931; member of the Idaho State Medical Association; aged 39; died, October 8, in Ann Arbor, Mich., of Addison's disease.

William Franklin Bolton, Vacherie, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1904; member of the Louisiana State Medical Society; aged 67; died, September 22, of coronary thrombosis.

Marion Le Cocq, Portland, Ore.; University of Oregon Medical School, Portland, 1924; member of the Oregon State Medical Society; served during the World War; aged 47; died, September 18, of bronchopneumonia.

Edgar Thomas Cecil, Rainelle, W. Va.; Jefferson Medical College of Philadelphia, 1900; member of the West Virginia State Medical Association; aged 65; died, October 10, of cerebral hemorrhage and heart disease.

Theodore Brooks Breck, Cleveland; Western Reserve University Medical Department, Cleveland, 1887; aged 79; on the staff of the Glenville Hospital, where he died, October 15, of uremia and aplastic anemia.

Nils Victor Sandin, Ashland, Wis.; Chicago College of Medicine and Surgery, 1914; on the staffs of St. Joseph's Hospital and the Ashland General Hospital; aged 55; died, October 5, of coronary thrombosis.

Benjamin Lee Ashworth, Marion, N. C.; College of Physicians and Surgeons, Baltimore, 1892; member of the Medical Society of the State of North Carolina; aged 74; died, October 19, of myocarditis.

Joseph Franklin Slade, Stony Creek, Va.; Bellevue Hospital Medical College, New York, 1888; member of the Medical Society of Virginia; aged 79; died, October 14, of cardiovascular disease.

Thomas Lincoln Craig, Davenport, N. Y.; Baltimore University School of Medicine, 1892 and 1893; for many years county coroner and town health officer; aged 76; died, October 17, of myocarditis.

William Brill, Los Angeles; Columbia University College of Physicians and Surgeons, New York, 1887; aged 77; died, October 13, in the California Hospital of hemiplegia and carcinoma of the colon.

Ben Garfield Budge ⊕ Ames, Iowa; Northwestern University Medical School, Chicago, 1909; past president of the Story County Medical Society; aged 59; died in October of coronary occlusion.

Frederick Wellington Buck, Washington, D. C.; Central Medical College of St. Joseph, Mo., 1902; served during the World War; aged 68; died, October 24, of lymphosarcoma of the thorax.

Nathaniel S. Word, Camden, Ark.; Memphis (Tenn.) Hospital Medical College, 1900; member of the Arkansas Medical Society; aged 68; died, October 9, of carcinoma of the prostate.

Carl William Ekermeier, New Bremen, Ohio; Eclectic Medical College, Cincinnati, 1924; member of the Ohio State Medical Association; aged 41; died, October 11, of coronary occlusion.

Joseph Giguere, Worcester, Mass.; School of Medicine and Surgery of Montreal, Que., Canada, 1889; aged 83; died, October 16, in the City Hospital of basal cell carcinoma of the nose.

Abram B. Mosher, Bellemead, N. J.; University of the City of New York Medical Department, New York, 1879; aged 86; died, September 4, of chronic myocarditis and arteriosclerosis.

Samuel Forer ⊕ New York; Long Island College Hospital, Brooklyn, 1931; aged 36; on the staff of the Lebanon Hospital, where he died, October 11, of pulmonary embolism.

Louis A. Brandenburger ⊕ St. Louis; Marion-Sims College of Medicine, St. Louis, 1899; pathologist for the city coroner's office; aged 65; died, October 5, of carcinoma.

Orrie Lester Marks, Pittsburgh; University of Pittsburgh School of Medicine, 1908; on the staff of St. Joseph's Hospital; aged 60; died, October 9, of coronary occlusion.

Daniel Richard Lucy, Denver; Gross Medical College, Denver, 1896; formerly member of the city council; aged 81; died, October 21, of acute nephritis and myocarditis.

Albert Brueggeman, Cincinnati; member of the Ohio State Medical Association; aged 71; died, October 19, in the Good Samaritan Hospital of coronary heart disease.

Telfer Joshua Norman, Vancouver, B. C., Canada; McGill University Faculty of Medicine, Montreal, Que., 1887; aged 78; died recently of carcinoma of the prostate.

Lewis Foster Woodruff, Cedar Rapids, Iowa; State University of Iowa College of Medicine, Iowa City, 1890; aged 79; died, September 29, of coronary occlusion.

Bureau of Investigation

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Adia Tablets—As these will not bring about neutralization of hyperacidity, give relief from acid stomach, protect irritated parts or membranes of the stomach in any manner or form a protective coating over the stomach parts or membrane, the Adlerka Company of St. Paul promised the Federal Trade Commission in April 1941 to withdraw these advertising misrepresentations.

A. G. Luebert Preparations—These are put out by one A. G. Luebert of Coatesville, Pa., who signed a stipulation with the Federal Trade Commission in June 1941. In this he promised to cease representing that "Nox Em Tablets and Capsules," "Ka No Mor Capsules," "Nox Pan Tablets" and "Luebert's Laxative Tablets" are in all cases safe and harmless and to discontinue any advertisements which fail to reveal that frequent or continued use of these products may be dangerous, causing serious blood disturbances, anemia, collapse or a dependence on them and that they should not be given to children, or that "Luebert's Laxative Tablets" should not be used when abdominal pains, nausea or other symptoms of appendicitis are present, that its frequent or continued use may result in dependence on laxatives and that if a cutaneous rash appears the use of the product should be discontinued. Luebert further agreed to discontinue certain misrepresentations (not named in the stipulation abstract) regarding "Nox Em Corn Plaster," "Nox Em Jelly," "Nox Pan Tablets," "Ka No Mor Capsules," "Iron Tonic Tablets" and also misrepresentations as to the alleged value of "Nox Em Tablets and Capsules," in treating neuritis, gout, sciatica, rheumatism or stiff or sore joints.

Buellene—In April 1941 S. D. Cates, operating as Buel Company, Chicago, signed a stipulation with the Federal Trade Commission in which he agreed to cease representing that this product is effective in the treatment of falling hair or of dandruff, unless the representation is limited to assistance in the removal of accumulated dandruff scales, that his "Hot Oil Treatments" make the hair healthy or stop brittle, breaking hair or that any of his products is a hair grower.

Chelf's C C Compound or C C C C or 4C's—This product is put out by Chelf Chemical Company, Richmond, Va., and reported by the Federal Trade Commission to contain among other ingredients, potassium bromide and acetanilid. In March 1941 the Chelf concern stipulated with the Federal Trade Commission that it would cease representing that this preparation will remove the cause of headaches, indigestion or nervousness or remedy these conditions, that it may be safely used by all persons under all conditions, will not have a depressing effect on the heart and will relieve general colds or head colds, unless this representation is limited to palliative relief of aches and pains accompanying such colds. The concern also agreed to discontinue advertisements which fail to reveal that the product should not be used in excess of the dosage recommended and that its frequent or continued use may be dangerous.

Cheney Products—The G. S. Cheney Company, Boston, promised the Federal Trade Commission in April 1941 that it would discontinue certain misrepresentations in the sale of "Cheney's Nerve Phosphates" also known as "Cheney's Nerve Phosphates." Among these were that by the use of the words "Nerve" and "Nerve" or similar terms the preparation is represented as having value for bodily ailments caused by nervous disorders, that it is a food or stimulant for the nerves or relieves sleeplessness and fatigue and that its lecithin content will add to the phosphorus constituent of brain and nerve substance. The Cheney concern also agreed to cease representing that "Cheney's Vitamins Complete" is a valuable accessory to one's daily diet, unless the advertising clearly explains that the product is valuable only when there is a deficiency of vitamins and minerals which the Cheney product contains.

Circulin Garlic Pearls—These are put out by one Fred Miller, trading as the Miko Company, Long Island City, N. Y. In April 1941 Miller promised the Federal Trade Commission that he would cease advertising that this product is rich in body building materials such as manganese, sodium, calcium, iodine and phosphates has any value in relieving symptoms of nervousness, dizziness and tiredness in excess of temporarily relieving such symptoms when associated with high blood pressure or is effective in treating coughs, bronchitis or bronchial asthma.

Cliff Edwards No. 7 and No. 11—These are preparations for the hair put out by Cliff Edwards, who operates as Cliff Edwards Hair Wax, Los Angeles. In January 1941 he promised the Federal Trade Commission that he would cease representing that these products will cause hair to grow or in any way aid in growing hair on a naturally bald head, that

they are new in the sense that they consist of ingredients other than such as have long been recognized for use in scalp treatments, and that they were created by a prominent cosmetologist and dermatologist.

Corn-Go—This is no longer to be advertised as instantly stopping the pain of corns or calluses, preventing their recurrence, removing bunions or in any way proving of value in their treatment, according to a stipulation signed with the Federal Trade Commission in May 1941 by Benjamin Ingber, trading as Leonard Sales Company, Philadelphia.

Crystal-Sheen, Dandruff Eradicator and Lanoleen—These are put out by General Beauty Products Company of Chicago, of which Hec Barth, Mrs. Hec Barth and Samuel Barth are copartners. In May 1941 these persons stipulated with the Federal Trade Commission that they would discontinue certain misrepresentations. They agreed to cease using the name "Crystal-Sheen" or in any other way causing the public to confuse this hair rinse product with a competitive one, "Sparkle-Sheen," to discontinue employing any word as part of the trade name for, or any representation relating to the product "Dandruff Eradicator," so as to imply that this, when used on the scalp, will eradicate, remove or destroy dandruff or promote hair growth or feed or nourish dry scalps. The Barths also promised to discontinue using as a brand name for their emulsion the word "Lanoleen," or any other phonetic spelling of the word "lanolin," alone or in connection with other words so as to imply that their product is a lanolin product or that its lanolin content is substantial and contributes any value.

Deep-Skin Electro-Mask—As the Federal Trade Commission ruled that this device will not reestablish natural functions of the underskin, glands, circulation or nervous system, normalize the skin, revitalize the tissues, prove an effective remedy for wrinkles, crow's feet, enlarged pores, pimples, blackheads, dry or oily skin, accomplish all the benefits of the most extravagant salon facial or constitute a sure means of attaining beauty, the Commission in April 1941 announced that Inspire, Inc., of San Francisco and its president, Edgar D. Sloat, had signed a stipulation agreeing to withdraw these advertising misrepresentations. They further promised to cease using the words "Deep Skin" as a part of the brand name or representing in any manner that the effect of the device extends deeply into the skin, acts directly on the dermis or acts from the inside outward. In May 1941 the Commission accepted a similar stipulation from Kelso Norman and Louis L. Layne, trading as Kelso Norman Organization, San Francisco, an advertising agency.

Diatest Tester—This device was represented in the advertising as the only tester that does not use or require flame in determining the sugar content of urine and as the most accurate tester available for determining such sugar content. Accordingly the Federal Trade Commission in April 1941 reported that Alfred Muller, trading as Diatest Laboratories, New York, had signed a stipulation agreeing to withdraw this misrepresentation from his advertising.

Donna Lo Cosmetics—These are put out by the Donna Lo Laboratories, Inc., St. Louis, which in April 1941 promised the Federal Trade Commission that it would discontinue the following misrepresentations. That these products provide a new kind of skin care, correct skin ailments generally, permit the skin or its pores to breathe, decrease the size of the pores and cause the blood stream to circulate through inactive areas of the face. The concern also agreed to cease representing by use of the brand name "Circulation Emulsion" that this product stimulates circulation, that its "Donna Lo Face Powder" is made in France or from a French formula and that face powder sold by competitors contains ingredients which close or seal the pores of the skin.

Dr. Haines Shoes—In May 1941 the Superior Shoe Company, Inc., Chicago, stipulated with the Federal Trade Commission that it would cease employing the terms "Doctor" or "Dr." either alone or in connection with a name or with any other words as a trade name, brand or designation for its products so as to imply that they are made in accordance with the design or under the supervision of a physician and contain scientific or orthopedic features which are the result of medical determination or service.

Eldredge's (Dr.) Approved Rectal Jelly—In April 1941 Alton W. Eldredge, trading as Melrose Eldredge Company, Melrose, Mass., stipulated with the Federal Trade Commission that he would cease representing, by the use of the terms "Doctor," "Dr." or "Approved" as a part of the trade name of this product, that it has the official recommendation of doctors or pharmacists or was formulated by a physician, that it is a cure for hemorrhoids or has any effect on the symptoms of the ailment except to the extent that it may act as an astringent, provide some antiseptic action or afford the soothing effect of an emollient.

Formula X—This treatment consists of two products, "Formula X Liquid" and "Formula X Pomade," put out by Adolph R. Phillips and Daniel B. Scott Jr., trading as Adolph's Beauty Products Company, Philadelphia. In June 1941 the Federal Trade Commission accepted a stipulation from these persons in which they promised to cease advertising that these products will cause the hair to grow or will be of any benefit in treating dandruff and eczema beyond the temporary relief of itching, and that they have any merit in treating falling or brittle hair. Further, they promised to discontinue any advertisements of Formula X Liquid which fail to reveal that unless used in specified proper dilution it would cause a pronounced local inflammation or other injury.

Grace Donohue Cleanser—This is put out by Grace Donohue, Inc., of New York, which concern stipulated with the Federal Trade Commission in April 1941 that it would desist from advertising that the product is a healing agent and constitutes an efficient method for preserving a clear, smooth or attractive complexion. The firm also agreed to cease represent-

ing that the product is a remedy or cure for blackheads or whiteheads and is beneficial in the treatment of acne, crow's feet, lines under eyes or oily or dry skin. The Philip Ritter Company, Inc., of New York, which handles the advertising of the Donohue concern, signed a similar stipulation in June 1941.

Grover Graham Remedy and Graham's Butternut Pills—In April 1941 the Federal Trade Commission accepted from the S. Grover Graham Company, Inc., Newburgh, N. Y., a stipulation which promised that certain misrepresentations would be discontinued in the sale of these products. According to the stipulation, the word "Remedy" or any similar words as a part of the trade name of "Grover Graham Remedy" were to be with drawn and the preparation was no longer to be represented as anything more than a treatment to neutralize temporary excessive gastric acidity and to relieve temporarily the pain caused thereby. The concern also stipulated that it would cease advertising that "Graham's Butternut Pills" consist of a vegetable ingredient, without disclosing that it contains only the extract from a vegetable, and that it will discontinue representing that the product is a tonic or is a remedy for any disease or dysfunction or for habitual constipation, headache, biliousness and all disorders arising from inactivity of the liver or torpidity of the bowels. The Hevener Advertising Agency, Inc., of Albany, N. Y., signed a similar stipulation.

Humana Products—These are put out by Gustave Goldstein, a hair goods and cosmetic dealer trading as Humana Hair Goods and Speciality Company, New York. In May 1941 Goldstein stipulated with the Federal Trade Commission that he would discontinue advertisements which fail to reveal conspicuously certain dangerous possibilities in the use under certain conditions of "Magic Shaving Powder" and "Kongolene," and which advertisements represent that "Apex Pimento" and "Humana Dandruff Treatment" will prevent dandruff or will do more than remove such of it as has already formed on the scalp and that "Humana Dandruff Treatment" and "Amron New Hair Aid" will stop hair from falling. On three different dates in 1936 the Commission had ordered the Humana concern to discontinue certain misrepresentations in the sale of its various preparations, specifically mentioning "Magic Shaving Powder," "Ro-Zol Face Bleach" and "Requis Hair Oil."

Kaucky's Formula Herb Tea—This is put out by one Emanuel Kaucky, trading as Kaucky's Pharmacy, Berwyn, Ill. In April 1941 this person entered into a stipulation with the Federal Trade Commission in which he agreed to discontinue certain advertising misrepresentations. Among these were that the use of this product will cause one to have a clear body or a clear mind, will cause the system to return to normal, relieve rheumatism or have any value in treating headaches beyond affording relief from these due to constipation or that it is worth anything in the treatment of constipation or stomach, intestinal, bladder or kidney ailments in excess of that afforded by a laxative and diuretic.

Locao Belem—That this product will grow hair or cure baldness falling hair, dandruff and other scalp disorders rejuvenate the scalp, stimulate or revitalize hair cells and give new life to hair were misrepresentations that the Belem Products Company, Houston, Texas, promised to withdraw from the advertising, in a stipulation that it signed with the Federal Trade Commission in May 1941.

Lucky Tiger, Lucky Tiger with Oil and Sulpho-Olive Treatment—These are products of the Lucky Tiger Manufacturing Company, Kansas City, Mo., which stipulated with the Federal Trade Commission in June 1941 that it would cease advertising that either of the two first named products removes the cause of dandruff or has any value in treating it in excess of temporary removal of loose scales of dandruff, that either of these preparations will permanently stop scalp itching or as part of the "Sulpho-Olive Treatment," will reduce or prevent the loss of hair or eliminate scalp disorders and that no competing product will produce like results. The concern further agreed to discontinue the misrepresentations that "Lucky Tiger" removes the cause of or cures dry hair or that "Lucky Tiger with Oil" affects this condition in any other way than by supplementing with oil to relieve it temporarily.

Mack Brothers Products—In April 1941 Eleanor H. Mack, trading as Mack Brothers Products, San Diego, Calif., promised the Federal Trade Commission that she would cease using the word "Resuscitator" as part of the brand name for her cosmetic preparation "Revel No. 9 Resuscitator Oil" or otherwise representing that the use of this product restores life or the appearance of youth to the skin, and that she would stop employing the phrase "Pore Cleansing" as a part of the brand name of "Revel No. 1 Pore Cleansing" or otherwise representing that it will remove all foreign matter from the pores. Miss Mack also agreed to cease representing that "Revel No. 6 Lipid Cream" is of any appreciable benefit in the treatment of aged or crepey skin and that "Revel No. 16 Mouth Creme" is of value in treating bleeding or receding gums.

Ne-Wa-Tee Native Herbs—That this is an effective treatment for stomach, liver and kidney diseases and other ailments and will help the user to avoid appendicitis, catarrh, fevers, asthma, indigestion and other ailments, except as a purgative or laxative which should be sold with a caution notice, were claims which Oscar F. Fox and W. Harvey Patterson of Greenville, S. C., promised to withdraw from the advertising, in a stipulation that they signed with the Federal Trade Commission in June 1941.

Newbro, Queen and Tuxedo Preparations—These are put out by the Newbro Manufacturing Company of Atlanta, Ga., which in June 1941 stipulated with the Federal Trade Commission that it would discontinue the following advertising misrepresentations: That "Tuxedo Club Pomade" invigorates the scalp or helps the hair as nothing else will, that "Queen Hair Dressing" also designated as "New Improved Queen Hair

Dressing," is a hair grower or supplies food for the hair, that "Queen Instant Skin Whitener," also designated as "New Improved Queen Instant Skin Whitener" and as "Queen Skin Whitener Ointment" improves the tone of the complexion or retards the formation of black heads, that "Queen Skin Soap," also known as "New Improved Queen Skin Soap," helps to heal skin blemishes, that "Queen Peroxide Vanishing Cream" (or "New Improved Peroxide Vanishing Cream") imparts a fine-grained appearance to the skin, and that "Queen Cold Cleansing Cream" loosens impurities or smooths lines or wrinkles. In September 1941 the Commission announced that Cole and Company, Memphis, Tenn., an agency handling the advertising of the Newbro concern, had signed a stipulation making similar promises.

Nix Bleach Cream—In April 1941 P. Edwards, Memphis, Tenn., trading as the Nix Cosmetics Company, stipulated with the Federal Trade Commission that he would cease advertising that this cream affects the skin in a new way or in any way different from that of other preparations. In September 1941 the Commission announced that Cole and Company, Memphis, Tenn., an agency handling the Nix advertising had signed a stipulation making similar promises.

Nu-Hair—I. Orlo Johnson, E. B. Masters and Coryell Inc., all of Detroit, signed a stipulation in April 1941 with the Federal Trade Commission in which they promised to discontinue certain misrepresentations in the sale of "Nu Hair." The stipulation provided that they would cease using the brand name Nu Hair in such a way as to imply that it will grow or produce hair, that they would desist from advertising that their product represents the professional secret of a scalp specialist or is a scientific or revolutionary hair, scalp or skin preparation and is capable of preventing, removing or relieving baldness, dry or itchy scalp or of restoring the natural oils of the scalp or of controlling or helping to control the glandular activity of the scalp.

Regulator 68B—This is put out by one Felix J. Bentz, trading as Dr. Bentz Laboratory, Athol, Mass. In May 1941 Bentz promised the Federal Trade Commission that he would discontinue representing in his advertising that poisons in the blood stream are the result of undigested food stagnating or fermenting in the intestinal tract, that "Regulator 68B" is a blood cleanser, that by its use poisons will be eliminated from the system, that it regulates or stimulates the bowels, liver or digestive system to normal activity or regularity, or that its therapeutic action is other than that of a laxative or cathartic.

Ruth Clark Preparations—A stipulation was signed with the Federal Trade Commission in May 1941 by Ruth Clark, trading as Ruth Clark's Products, Los Angeles. In this she promised to cease representing, through the use of the word "Vitamin" or the abbreviation "Vit" in connection with the letter "A" in the brand name of her products "Vit A Pac," "Vitamin 'A' Beauty Cream" and "Vit A Hair and Scalp Oil" that their vitamin A content has any beneficial effect on the skin, hair or scalp or that she manufactures or compounds all the products which she sells, that her "Re-Chemicalizing Bouillon" is of value in the relief, treatment or correction of arthritis, neuritis, colds, nervousness or skin troubles or as a reducing aid of itself or when combined with "Blendavita Tea" or that the "Bouillon" has value in treating or correcting anemia or an underweight condition in excess of the benefits that may accrue from its food elements, or that it will "re-chemicalize" the system, that "Blendavita Tea" is of any value in treating kidney, bladder or skin ailments, or insomnia, or acts as an alkalinizing agent, that "Oils of Youth" will keep the body internally clean, or that "Vitamin 'A' Concentrate" would be valuable to persons suffering from frequent colds, sinus trouble or skin infections, unless the claims reveal that it would be helpful only in cases of vitamin A deficiency.

Sheer Mold Reducing Girdle—In June 1941 the Federal Trade Commission accepted from the LaVel Company, trading as Sheer Mold Company of Hollywood, Calif., and the General Advertising Agency, Inc., of Los Angeles, a stipulation that they would discontinue certain misrepresentations in the advertising of the girdle. They agreed to cease using the word "Reducing" as part of the trade name of the product and any words similar to "reducing" as descriptive of the girdle or of the results it is supposed to produce, which terms imply that the wearing of this garment will cause a reduction of local or bodily tissues or will effectively remove fat. These concerns admitted in the stipulation that though the wearing of this garment may change physical appearance by compressing that portion of the body about which it is placed it will not effectively remove fat.

Slumber Ointment—Frank D. Seiple, operating as The Nolan Company, Greenville, Pa., promised the Federal Trade Commission in May 1941 that he would cease advertising that this product is a competent treatment for ringworm in all cases or in any cases except those involving superficial ringworm infection, and that it is a remedy for athlete's foot unless it is expressly limited to superficial organisms and the relief of itching, that it is of any value in treating eczema, salt rheum, grease and rubber poisoning, cutaneous diseases or general poisoning beyond giving temporary relief from the itching which may accompany these conditions.

Vev—In May 1941 the Federal Trade Commission accepted a stipulation from R. V. Annen, trading as General Vitamins Company, Clarksburg, W. Va., in this he agreed to cease representing that "Vev" is a vitamin laxative or contains vitamins sufficient to have any therapeutic or dietetic effect, and Annen also agreed to cease representing by use of the words "erl" and "elmin" or similar ones that his product is a remedy for constipation or is of any value in treating this condition beyond that of affording temporary relief from its symptoms. He further stipulated among other things that he would cease disseminating advertisements which fail to reveal that his product should not be used when abdominal pain or other symptoms of appendicitis are present and that its frequent or continued use may result in dependence on laxatives.

Correspondence

SENSITIVITY TO SULFATHIAZOLE

To the Editor:—Continuing the report of Dr. Merritt H. Stiles of Philadelphia on the hypersensitivity to sulfathiazole, which appeared in *THE JOURNAL*, October 18, page 1378, I would like to join him in reporting symptoms at variance with the statement of Wein and Lieberthal (*THE JOURNAL*, September 6, page 850), in which they report only nausea and vomiting following the administration of sulfathiazole. In checking my records on the last 50 patients to whom this drug has been given in the standard dosage of different drug houses of 7.7 grain (0.5 Gm.) tablets varying from 3 to 10 tablets in twenty-four hours, I find that 6 of the patients in addition to nausea and vomiting had temperatures ranging from 102 to 104 F. and 3 of these also had a distinct cutaneous rash. These symptoms appeared after the drug had been stopped for a few days and resumed again. The symptoms appeared within the first twenty-four hours after the resumption of this medication. The symptoms subsided at once when the drug was stopped and the fever and other symptoms reappeared a few hours after the drug was resumed. Not having seen previous reports of the hypersensitivity of this drug, especially the febrile and cutaneous manifestations, I was at a loss to understand it. But since others are now reporting it and since it is evidently not generally known, I feel that my small series of cases shows a sufficiently high percentage of these complications to warrant recording, so that all facts and complications encountered with this relatively new medicament will be widely disseminated. Undoubtedly it is a wonderful and potent drug, but it evidently needs some slight change, alteration or refinement to eliminate the factor or factors causing these apparent hypersensitive symptoms.

PAUL R. STALNAKER, M.D., Houston, Texas.

HEALTH AND THE DOCTORS

To the Editor:—I wish to comment on an item under current comments on page 1269 of *THE JOURNAL* October 11.

The part which quotes the last paragraph of "Health and the Doctors," is excellent. This is the exact attitude that I have always hoped organized medicine would take. The use of "the technic of scientific experimentation to determine the actual values before general adoption" is clearly indicated.

During the past five years, I have tried to study at first hand the various forms of payment plans—both those which offer indemnification in cash and those which offer indemnification in service. Naturally I have formed certain opinions as to the effectiveness of various patterns. I am convinced that there is one very important major consideration, as yet neglected, that the "technic of scientific experimentation" will uncover, namely that payment plans will not assume major scientific and social importance until they become implements for the rational practice of health conservation and preventive medicine. When they are used to provide a method for paying physicians on a "private" and personal basis to keep the incidence and severity of disease among individuals and families at the lowest possible level, then and then only will they accomplish worth while results.

I am convinced that prepayment is a necessity in such a program because the public is not as yet well enough educated in the benefits of prevention to be willing to purchase it on a fee-for-service basis. Just what form of prepayment will do this the best I am sure I do not know at this time. However I am sure that the various types ought to be under constant scrutiny from authoritative and impartial sources and all interested should be kept posted on current progress.

KINGSLEY ROBERTS, M.D., New York.

Medical Director, Medical Administration Service.

POSSIBLE HAZARD IN USE OF OILED SILK BIB

To the Editor:—Believing that the oiled silk baby bib presents a real hazard, I submit the following report:

Susan Fuller, aged 6 months, in perfect health, was lying awake in her bed, wearing an oiled silk bib. Something prompted the mother to go upstairs to take her a toy and she found the wet bib draped over the baby's face plastered against the mouth and nostrils. Respirations had ceased and the baby was apparently dead; she was rushed across the street to my office and found to be limp, her hands were cyanotic, her face and forehead were blotchy and there was bloody froth drooling from the nostrils and mouth. Artificial respiration succeeded in reviving her; except for a few spells of coughing up mucus, her recovery was uneventful and complete.

It is suggested that, if this type of bib is used, it should be pinned to the shirt. CURTIS M. GALT, M.D., Manteca, Calif.

HAZARDS OF FIREWORKS ON CHRISTMAS AND NEW YEAR HOLIDAYS

To the Editor:—The American Medical Association has the gratitude of all who are laboring for adequate legislative control of fireworks. Your contribution in the form of the "Annual Survey of Fourth of July Accidents" is perhaps the most helpful and influential aid we have in bringing about the adoption of adequate state fireworks laws throughout the country.

The survey does have, however, one important limitation which actually tends to make more difficult the efforts to extend fireworks laws in a large section of the country. This is simply that the survey covers only the period shortly before and after Independence Day, while, in the South, fireworks are used much more extensively in the celebration of Christmas and New Year's Day. The result is that any accounting of fireworks accidents resulting from Independence Day celebrations only places the Southern states in a very favorable position as compared to their northern and western neighbors, where fireworks celebration of July Fourth is traditional and where celebration of Christmas and New Year's Day with fireworks is relatively unknown. Thus the "Annual Survey of Fireworks Accidents" in its present form may be presented in certain Southern states by the fireworks interests to show that any legislative control of this hazard is apparently unwarranted.

I feel sure that a record of fireworks accidents occurring at the time of the Christmas and New Year holidays in say a dozen Southern states would reveal the true fireworks hazard in these states and greatly facilitate efforts to reduce these accidents through proper legislative control of fireworks. We would request that the American Medical Association make such a survey during the coming holidays and suggest that the survey include the states of Virginia, Kentucky, Missouri, Tennessee, North and South Carolina, Georgia, Alabama, Mississippi, Arkansas and Louisiana.

PERCY BUGBEE, Boston.

General Manager, National Fire Protection Association.

FORMULA FOR SULFATHIAZOLE OINTMENT

To the Editor:—In the article "Sulfathiazole Ointment in the Treatment of Cutaneous Infections," which appeared in *THE JOURNAL*, October 25, we suggested as an ointment base for the sulfathiazole equal parts of hydrous wool fat and vanishing cream.

We recently have been preparing the ointment as follows: sulfathiazole 5 per cent, aquaphor (cholesterinated petrolatum) 25 per cent and cold cream 70 per cent.

We believe that the ointment base prepared with aquaphor and cold cream is more satisfactory than the ointment base prepared with hydrous wool fat and vanishing cream.

EDMUND L. KEENEY, M.D., Baltimore.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, November 22, page 1808.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Feb. 9-11. Part III. Boston, November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Part I. Various centers, March 31. Final date for filing application is Dec. 31. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral.* April in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association. Applications should be on file 6 weeks in advance of the date of oral examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: New York, June. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written.* Part I. Group B. Various centers, Jan. 3. *Oral.* Part II. Groups A and B Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* March 7. Final date for filing application is Dec. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral and Written.* All Groups. Philadelphia, June, preceding the meeting of the American Medical Association. Final date for filing application is March 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PATHOLOGY: St. Louis, March 30-31. Final date for filing application is Jan. 30. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Philadelphia, March 30-31, preceding the Region I meeting of the American Academy of Pediatrics. Los Angeles, April 22, preceding the Region IV meeting of the American Academy of Pediatrics. Cleveland, May 13, preceding the Region III meeting of the American Academy of Pediatrics. *Written.* Locally, February 14. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY: *Oral.* All Groups. Atlantic City, June 4. Final date for filing application is April 1. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: *Written.* Various centers, December. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Pennsylvania July Report

The Pennsylvania State Board of Medical Education and Licensure reports the examination for medical licensure held at Philadelphia and Pittsburgh, July 8-10, 1941. The examination covered 5 subjects and included 50 questions. An average of 75 per cent was required to pass. Four hundred and fifteen candidates were examined, 399 of whom passed and 16 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists.....	(1941, 2)		2
George Washington University School of Medicine.....	(1940, 3)		3
Georgetown University School of Medicine.....	(1939), (1940, 5)		6
Howard University School of Medicine.....	(1940, 2)		2
Loyola University School of Medicine.....	(1941)		1
Northwestern University Medical School.....	(1941)		1
Rush Medical College.....	(1939)		2
University of Chicago, The School of Medicine.....	(1939), (1940)		2
Indiana University School of Medicine.....	(1940)		1
University of Louisville School of Medicine.....	(1907)		1
Baltimore Medical College.....	(1938), (1939)		2
Johns Hopkins University School of Medicine and College of Physicians and Surgeons.....	(1940, 2)		2
University of Maryland School of Medicine.....	(1938, 2), (1940)		3
Harvard Medical School.....	(1940)		1
University of Michigan Medical School.....	(1940)		1
University of Minnesota Medical School.....	(1940)		1

St. Louis University School of Medicine.....	(1940, 2)	2
University of Nebraska College of Medicine.....	(1939), (1940)	2
Cornell University Medical College.....	(1940, 2)	2
Long Island College of Medicine.....	(1940)	1
Syracuse University College of Medicine.....	(1940, 2)	2
University of Buffalo School of Medicine.....	(1904)	1
Univ. of Rochester School of Medicine and Dentistry.....	(1940)	1
Ohio State University College of Medicine.....	(1940)	1
Western Reserve University School of Medicine.....	(1940)	1
Hahnemann Medical College and Hospital of Philadelphia.....	(1939, 5), (1940, 56), (1940)*	62
Jefferson Medical College of Philadelphia.....	(1938, 3), (1939, 24)	78
Temple University School of Medicine.....	(1939, 22), (1940, 39)	61
University of Pennsylvania School of Medicine.....	(1938), (1939, 33), (1939)*	80
University of Pittsburgh School of Medicine.....	(1940, 42)	42
Woman's Medical College of Pennsylvania.....	(1936), (1939, 2), (1940, 7)	10
Medical College of the State of South Carolina.....	(1940, 2)	2
Meharry Medical College.....	(1940)	1
Medical College of Virginia.....	(1939, 3), (1940)	4
University of Toronto Faculty of Medicine.....	(1940)	1
University of Western Ontario Medical School.....	(1940)	1
McGill University Faculty of Medicine.....	(1940, 3), (1940)*	4
Medizinische Fakultät der Universität Wien.....	(1925), (1933, 2), (1934), (1936), (1938)	6
Deutsche Univ. Medizinische Fakultät, Prag.....	(1934), (1939)	2
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1934)	1

School	FAILED	Year Grad.	Number Failed
Hahnemann Medical College and Hospital of Philadelphia.....	(1940, 7)		7
Temple University School of Medicine.....	(1940, 2)		2
Meharry Medical College.....	(1940)		1
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultása, Budapest.....	(1939)		1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia.....	(1938)		1
Regia Università degli Studi di Messina. Facoltà di Medicina e Chirurgia.....	(1937)		1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....	(1938), (1939)		2
Regia Università degli Studi di Napoli. Facoltà di Medicina e Chirurgia.....	(1939)		1

Thirty-eight physicians were licensed to practice medicine by reciprocity and 18 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from February 10 through September 25. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Georgetown University School of Medicine.....	(1934)		Maryland
Howard University College of Medicine.....	(1932)		Virginia
Northwestern University Medical School.....	(1935)		Illinois
University of Illinois College of Medicine.....	(1917)		Illinois
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1927) West Virginia, (1931)		New York
Tufts College Medical School.....	(1932)		Maine
Univ. of Michigan Medical School.....	(1926), (1931), (1933)		Michigan
Columbia University College of Physicians and Surgeons.....	(1919), (1925), (1936)		New York
Cornell University Medical College.....	(1906)		New York
University and Bellevue Hospital Medical College.....	(1934)		New York
Syracuse University College of Medicine.....	(1911)		Maine
University of Buffalo School of Medicine.....	(1936)		New York
Ohio State University College of Medicine.....	(1931), (1932)		Ohio
Hahnemann Medical College and Hospital of Philadelphia.....	(1920)		Delaware
Jefferson Medical College of Philadelphia.....	(1932), (1935) New Jersey, (1934), (1938) New Jersey, (1937) New York, (1940) Maryland		
Temple University School of Medicine.....	(1939) New Jersey, (1934) New Jersey		
University of Pennsylvania School of Medicine.....	(1934) New Jersey, (1935) Missouri, (1939) Maryland		
Meharry Medical College.....	(1937)		Tennessee
Baylor University College of Medicine.....	(1932)		New York
University of Texas School of Medicine.....	(1932)		Texas
Medical College of Virginia.....	(1926)		Virginia
University of Virginia Department of Medicine.....	(1938)		Virginia
Marquette University School of Medicine.....	(1938)		Ohio

School	LICENSED BY ENDORSEMENT	Year Grad.
University of Colorado School of Medicine.....	(1939)	
University of Louisville School of Medicine.....	(1938)	
University of Louisville School of Medicine.....	(1934)	
Johns Hopkins University School of Medicine.....	(1940)	
University of Maryland School of Medicine and College of Physicians and Surgeons.....	(1936)	
Tufts College Medical School.....	(1940)	
Creighton University School of Medicine.....	(1937)	
New York Medical College and Flower Hospital.....	(1939)	
New York Medical College, Flower and Fifth Avenue Hospitals.....	(1934)	
University of Buffalo School of Medicine.....	(1936)	
Duke University School of Medicine.....	(1937)	
Jefferson Medical College of Philadelphia.....	(1940, 2)	
Temple University School of Medicine.....	(1940)	
University of Pennsylvania School of Medicine.....	(1940)	
University of Pittsburgh School of Medicine.....	(1940)	
University of Tennessee College of Medicine.....	(1938), (1940)	
University of Vermont College of Medicine.....	(1938)	

* Licenses have not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Foods: Liability for Illness Attributed to Drinking Liquid Containing Decomposed Spider.—In 2 very similar cases decided by the court of appeal of Louisiana, the plaintiffs sued bottling companies to collect damages for injuries alleged to have resulted from drinking Coca-Cola containing decomposed spiders.

In the Hollis case, the plaintiff, after drinking a portion of the contents of a bottle of Coca-Cola, felt some foreign substance pass into her mouth. It was a slightly decomposed black widow spider. The plaintiff received prompt medical attention but was nevertheless ill for an extended period of time. The medical evidence, as described by the court, was as follows:

According to the medical evidence in the record, the symptoms possessed by plaintiff are also produced, but in a more severe form, by the bite of a black widow spider. Dr. Chambers, who was the family physician, was unable to state whether or not they were the direct result of poison from such insect that was swallowed. He was definitely of the opinion, however, that her illness was brought about by the spider's presence in the drink, for, as stated by him, "she was not sick before she took it, and she got sick, and so acutely, afterwards."

The defense expert, Dr. A. G. McHenry, was of the belief that poison from a spider, if swallowed, would be destroyed by gastric juices and enzymes of the stomach, and no pernicious infection would result therefrom. He attributed the symptoms possessed by plaintiff to the expiring of her menopause, and to other causes. By the latter phrase was meant "from having taken something that she regarded unclean in her mouth", and he thought that shock and unpleasantness, such as would superinduce vomiting or nausea of different degrees of severity in different individuals, attended the taking. It was his opinion, however, that "a normal individual should be over the effects in a week."

The plaintiff obtained a judgment in the trial court and the defendant appealed to the court of appeal of Louisiana, second circuit.

In the Jenkins case, the plaintiffs, husband and wife, had also purchased bottles of the drink in a local drug store. Immediately after the wife's first swallow, taken through a straw, she became ill and nauseated. She was taken to a physician for treatment and subsequently recovered. In the physician's office, some thirty minutes after the wife had taken her first sip of Coca-Cola, the contents of the bottle were examined. They were found to contain portions of two disintegrated spiders of unstated variety. The medical evidence in this case, as described by the court, was as follows:

Dr. Ward testified that he examined Mrs. Jenkins shortly after she came upstairs and found rigidity of her abdominal muscles, raising of her eyebrows and nausea. Jenkins and his wife, without being asked by the doctor, told him that they had been drinking coca cola. This shows clearly that they then suspected that the coca cola had caused Mrs. Jenkins' illness, or else they wanted Dr. Ward to suspect this as a cause, and yet, despite this knowledge on their part, the husband was insisting on his wife drinking more of this coca cola to settle her stomach. Some thirty minutes after Jenkins and his wife had been in the doctor's office (during all of which time the bottle had been in the possession of Mr. Jenkins and had been uncapped since it was first opened in the drug store) Dr. Ward poured out the contents of the bottle into a pan and found what to him looked like portions of two disintegrated spiders which appeared to have been in the bottle for some time.

While Dr. Ward described Mrs. Jenkins' symptoms as those of a spider bite, except for the vomiting, he could not say that her illness was caused from anything she drank from the bottle nor from any poisonous substance. He expressed the opinion that a person could absorb poison by swallowing a spider, yet he was not sure of this as he had had no experience along that line. Mr. C. L. Clay, a toxicologist employed by the State Health Department, testified that, in his opinion, the swallowing of part of a spider would not cause the symptoms which Mrs. Jenkins had; that the poison or venom of a spider, if swallowed, would be digested as other food and would not get into the circulatory system unless there was some cut or abrasion in the mouth, throat or stomach through which it could be absorbed.

From an adverse judgment in the trial court, the plaintiffs appealed to the court of appeal of Louisiana, first circuit.

In the Hollis case, the court of appeal said that the manufacturer of bottled beverages is chargeable with knowledge of the contents of the bottles it sells for public consumption and that if ill effects follow the drinking of such contents the manu-

facturer is liable for injuries which result. The court further said, however, that the plaintiff was required to prove that her injuries were the proximate result of the defendant's acts and that such proof should be carefully scrutinized because the manufacturer usually has no eye witnesses to the occurrence. The court concluded that the evidence clearly showed that the bottle had not been tampered with before it was purchased by the plaintiff. Coca-Cola becomes flat a short time after the cap is removed because of the loss of carbon dioxide. The plaintiff testified that it was sparkling when she started to drink. The court of appeal, therefore, held that the plaintiff had sustained her burden of proof and affirmed the judgment in her favor.

In the Jenkins' case, the court said that the plaintiff was required to prove with certainty that the bottle contained some deleterious substance, that the substance did not get into the bottle after it left the defendant's plant and that the plaintiff swallowed some of the substance and that it made her sick. The evidence showed, the court pointed out, that the plaintiff told her husband after one swallow that she thought the Coca-Cola was making her sick but that she continued to take two or three more swallows after that. Though she became nauseated, neither she nor her husband complained to the drug clerk that her sickness was caused by something in the bottle. Finally, the court found that the bottle had been uncapped and in the husband's possession for at least half an hour before its contents were poured out and examined. The court considered it unreasonable to believe that the wife could have gotten enough poison to cause her illness in view of the fact that she drank only through a straw which would have prevented her from drawing in any but the smallest particles of a foreign substance. The court of appeal was of the opinion that the plaintiffs had failed to prove by clear and convincing evidence that the wife's illness was actually due to the drink, and the judgment for the defendant was accordingly affirmed.—*Hollis v. Ouachita Coca-Cola Bottling Co., Ltd.*, 196 So. 376 (La., 1940); *Jenkins v. Bogalusa Coca-Cola Bottling Co., Ltd.*, 1 So. (2d) 426 (La., 1941).

Federal Food, Drug and Cosmetic Act: Allegedly False Advertising Not Accompanying Actual Shipment of Product as Misbranding.—The defendant shipped certain vitamin products in interstate commerce. Apparently, separate and apart from the actual shipment of the vitamin products, the defendant sent to distributors of those products certain literature and advertisements, allegedly falsely representing that the products would cure a list of stated human ailments, which by the directions of the defendant the distributors were to place on their walls and shelves in proximity to the vitamin products offered for sale. The United States government, alleging that the literature and advertisements so separately shipped constituted misbranding of the vitamin products in violation of the Federal Food, Drug and Cosmetic Act, sought to enjoin the defendant from shipping such allegedly misbranded products in interstate commerce.

The government and the defendant stipulated that prior to the trial of the action the trial court should determine whether or not certain paragraphs of the bill of complaint, which paragraphs alleged facts substantially as noted, state a claim on which relief can be granted as against the defendant. Consequently, the sole question for the determination of the trial court, the district court, eastern district, Wisconsin, was whether the act of bringing written, printed or graphic matter containing false and misleading therapeutic claims in the presence of, proximity of or in association with an article, after shipment in interstate commerce, was a misbranding of that article within the meaning of the term "misbranding," as the term is used in the Federal Food, Drug and Cosmetic Act. That act, the court pointed out, provides in section 352(a) that a drug is deemed misbranded if its labeling is false or misleading in any particular, and section 321(m) defines labeling to mean "all labels and other written, printed or graphic matter (1) upon any article or any of its containers or wrappers, or (2) accompanying such article." In determining, said the court, the intent of Congress in enacting the two subsections just noted, the legislative history of the act in question should be considered.

The bill which on enactment became the Federal Food, Drug and Cosmetic Act, as introduced gave jurisdiction for its enforcement to the Department of Agriculture. While the bill was pending and possibly because of the desire of the Federal Trade Commission to enforce any provisions as to false advertising, a separate measure was passed (Public Act No. 447, 52 Stat. 111, 15 U. S. C. A., section 41) specifically giving jurisdiction over false advertising of foods, drugs and cosmetics to the Federal Trade Commission. Thereafter the Federal Food, Drug and Cosmetic Act was enacted giving jurisdiction to the Department of Agriculture to enforce the provisions as to adulteration, packaging and labeling, but the enforcement as to false advertising remained in the Federal Trade Commission. As this action was brought under the Federal Food, Drug and Cosmetic Act this court cannot here be concerned with any false advertising by the defendant, and the sole question to be determined is whether or not there was a misbranding by false or misleading labeling. The government necessarily contends for an extremely broad interpretation of the language of the act defining labeling, as noted. The government argues that when Congress said "accompanying such article," in section 321(m), which reads, in part, "The term 'labeling' means all labels and other written, printed, or graphic matter . . . (2) accompanying such article," it did not necessarily mean accompanying in the ordinary sense of the word as long as the literature eventually came together with the products before or when offered for sale. Congress, continued the court, did intend that labeling should be something more than the printed or written matter actually affixed to the article itself. It undoubtedly had in mind the practice of manufacturers of placing circulars and printed matters in cartons, which literature would not be affixed to the product to be sold. However, it would be a case of legislation by judicial construction to say that literature "placed on shelves, display counters, or in window displays" comes within the definition of labeling. It is advertising, pure and simple. The Congress could have provided that all written or printed matter displayed near or in proximity to the article was labeling; but it did not do so. Suppose the defendant provided a sign, extolling the virtues of his product, to be hung on the wall. Under the construction contended by the government, it could be considered labeling. What about a billboard across the street? At what point could a line be drawn where labeling would end and advertising begin? In view of the fact that Congress decided that evils in the field of advertising as to foods, drugs and cosmetics were to be handled by the Federal Trade Commission and the Federal Food, Drug and Cosmetic Act was therefore amended accordingly, there is no justification for any court to put a strained and unnatural construction on the term "labeling." Furthermore the Federal Food, Drug and Cosmetic Act is a criminal statute. Statutes creating and defining crimes are not to be extended by intentment because the court thinks the legislature should have made them more comprehensive. In the opinion of the court, therefore, the material paragraphs in the bill of complaint did not state a claim against the defendant on which relief could be granted.—*United States v. Lee*, 40 F. Supp. 801 (Wis., 1941).

Hospitals: Res Ipsa Loquitur as Applied to Ailment Following Childbirth.—The plaintiff sued the defendant hospital, alleging that after she was admitted to the hospital to be delivered of a child "twilight sleep" was administered and that while she was in the delivery room, unconscious, unknown agents and employees of the hospital negligently permitted portions of her body to strike against some unknown substance, thus causing, as she ascertained when she regained consciousness, two or three knots or sore spots on her head, severe headaches and soreness in her arms to the extent that she temporarily lost their use. At the trial, the patient's private physician, who had delivered her, stated that while she was in the delivery room she did not fall off the delivery table or bump her head and that nothing had happened or could have happened in the delivery room to account for her complaints. The knots, or sore spots, on her head, he testified, were not the result of an injury, since "to be from an injury there must

be a clot under the scalp," and in his treatment of the plaintiff he saw no such clot but observed a secretion which is found in an eczema "which can come from some infection; and sometimes they just come without any provocation." In his opinion, "the trouble he found on her head was an eczema." The soreness in her arms he attributed to her grasping, while unconscious, handles provided in the delivery room for such patients "to pull on." Relatives of the plaintiff testified as to their presence in the patient's room from the time she was returned from the delivery room until she regained consciousness and that in that period she did not fall out of bed or bump her head. At the conclusion of the plaintiff's case the trial court granted a nonsuit and the plaintiff, in effect, appealed to the court of appeals of Georgia, division 1.

The plaintiff apparently argued on appeal that the action of the trial court in granting a nonsuit was improper because the doctrine of *res ipsa loquitur* was applicable under the circumstances—that is, from the facts here present an inference of negligence on the part of the hospital should have been drawn. We do not think the doctrine of *res ipsa loquitur*, said the court, is applicable to the facts of this case. Consequently proof that three knots arose on the head of the patient after she became an inmate of the hospital, that she was unconscious a part of the time, that she suffered a severe pain in her head after the birth of the child and that she temporarily partially lost the use of her arm would not, without more, establish the fact that the hospital was negligent in allowing the patient's head to strike something, such as a part of the bed or the floor. Especially is this so when the plaintiff's physician gave it as his professional opinion that the knots were the result of eczema, that among other things the fluid which came out of the knots was not such as would have come from them had they been caused by a blow, and that they were not the result of a blow or any injury, that the headaches complained of frequently followed childbirth and, in his opinion, were not the result of a blow, and that the trouble involving the arm was common in childbirth cases and was not the result of any injury. As was said in *Georgia Ry. & El. Co. v. Harris*, 1 Ga. App. 714, 57 S. E. 1076, 1077:

When the party upon whom the burden of an issue rests seeks to carry it, not by direct proof, but by inferences, he has not, in this reasonable sense, submitted any evidence for a jury's decision until the circumstances he places in proof tend in some proximate degree to establish the conclusion he claims; and for this the facts shown must not only reasonably support that conclusion, but also render less probable all inconsistent conclusions.

Applying this rule to the facts in this case, we do not think that, admitting the circumstances proved and all reasonable deductions therefrom, the plaintiff showed any negligent conduct on the part of the hospital as alleged in her petition. The court of appeals accordingly held that the trial court had not erred in granting a nonsuit and affirmed the judgment in favor of the hospital.—*White v. Executive Committee of Baptist Convention*, 16 S. E. (2d) 605 (Ga., 1941).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, Jan. 12-13. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Diveley, 1103 Grand Ave., Kansas City, Mo., Secretary.
- National Society for the Prevention of Blindness, New York, Dec. 4-6. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York, Executive Director.
- Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
- Radiological Society of North America, San Francisco, Dec. 1-5. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse, N. Y., Secretary.
- Society for the Study of Asthma and Allied Conditions, New York, Dec. 6. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
- Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. Alton Ochsner, 1430 Tulane Ave., New Orleans, Secretary.
- Western Surgical Association, St. Paul, Dec. 5-6. Dr. Arthur R. Metz, 2449 Washington Blvd., Chicago, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery 11:81-116 (Sept.) 1941

Endocrine Therapy as Applied to Gynecology. R. W. TeLinde, Baltimore.—p. 81.

*Novocain Sympathetic Block Method of Therapy in Thrombophlebitis. M. DeBaKey and A. Ochsner, New Orleans.—p. 87.

*Management of Patients with Appendicitis, with Special Reference to Those with Perforation. C. N. Carraway, Birmingham.—p. 91.
Diagnosis and Treatment of Preeclampsia. R. Emens, Decatur.—p. 99.
Drugs in Infancy and Early Childhood: Dosage and Accurate Administration. R. E. Cloud, Birmingham.—p. 102.

Sympathetic Block for Thrombophlebitis.—DeBaKey and Ochsner believe that the best method of treating thrombophlebitis is the production of vasodilatation by blocking the regional sympathetic ganglion with procaine hydrochloride. The method is based on the concept that vasospasm resulting from impulses originating from the thrombosed venous segment is one of the most important factors in producing thrombophlebitis. The edema of the extremity in a patient with phlegmasia alba dolens should disappear within a relatively short time after sympathetic ganglion block. Similarly the other manifestations are also probably relieved by the increased vascularity. The dramatic relief of pain is probably due to the increased blood supply, the pain being the result of ischemia. The rapid subsidence of fever may also be explained on the basis of a more rapid resolution of the inflammation because of the increased vascularity to the involved venous segment. The pain of 85 per cent of 41 patients so treated was completely and permanently relieved within from fifteen to thirty minutes after the first injection and in the rest after the second injection. More than 60 per cent of the patients were free from fever within forty-eight hours. The temperature of all but 2 patients returned to normal within seven days. There was complete subsidence of edema within four days or less in 50 per cent of the patients, within five to eight days in 30 per cent and within nine to ten days in 15 per cent. This method of therapy shortened the period of convalescence and hospitalization. Approximately 90 per cent were discharged within twelve days. The sites of puncture for the lower extremity are determined by marking points approximately two and one-half fingerbreadths lateral to and horizontal with the spinous processes of the first four lumbar vertebrae. Each needle is inserted vertically until the transverse process is reached; its direction is then changed slightly toward the midline and it is inserted about two and one-half fingerbreadths beyond the transverse process, so that its point is near the anterior lateral surface of the body of the vertebra, where the sympathetic chain lies. Procaine hydrochloride, 5 cc. of a 1 per cent solution, is injected at each site. Blocks, two or three, should be done daily until the temperature drops to and remains normal. Radical treatment, ligation or excision of the involved venous segment or ligation of the vein proximal to a thrombophlebitic process, is rarely necessary.

Appendicitis.—Carraway states that since 1923, when the surgical staff and other members of the Norwood Clinic began to make a careful study of patients with appendicitis in an effort to lower the mortality, there has been a steady decrease in mortality. The decrease has been most definite during the last five years (0.31 per cent in all types of appendicitis). The decrease is a reflection of the great reduction of cases of rupture and abscess (from 30.8 to 3.4 per cent). Omitting 2 cases of abscessed appendix in which the diagnosis was not confirmed at operation or necropsy there have been only 2 deaths among 116 patients with perforated and/or abscessed appendixes, a mortality of 1.72 per cent during the last five years, during which immediate operation was always advocated. The author believes

that the following factors have helped to lower the mortality: (1) correct taking of the history and careful physical examination permitting an early diagnosis, (2) insistence that the family physician not procrastinate and if he is doubtful that he get a competent consultant, (3) recognition of the fact that in the patient whose onset of symptoms is severe and the cycle completed in a short time the appendix is more likely to become gangrenous and to rupture, making delay in operation unwise, (4) rigid postoperative care, especially of the patient with a ruptured appendix and (5) the assignment of patients with peritonitis to only the most thoroughly trained and experienced surgeons.

American Heart Journal, St. Louis

22:289-438 (Sept.) 1941

Autonomic Mechanism of Heat Conservation and Dissipation: Effects of Heating the Body, Evidence for Existence of Capillary Dilator Nerves in Anterior Roots. O. R. Hyndman and J. Wolkin, Iowa City.—p. 289.

Spinal Cord Ischemia in Dissecting Aortic Aneurysm. F. L. Tuohy, P. G. Boman and G. L. Berdez, Duluth, Minn.—p. 305.

Effect of Chronic Cardiac Compression on Size of Heart Muscle Fibers. J. T. Roberts and C. S. Beck, Cleveland.—p. 314.

Errors in Measurement of PR (PQ) Interval and QRS Duration in Electrocardiogram. P. D. White, C. E. Leach and S. A. Foote, Boston.—p. 321.

Observations on Reactive Hyperemia in Various Portions of Extremities. D. I. Abramson, K. H. Katzenstein and E. B. Ferris Jr., Cincinnati.—p. 329.

*Blood Picture in Rheumatic Fever. Valentina P. Wasson, E. E. Brown and Clarice Weintraub, New York.—p. 342.

Venous Pressure Responses to Exercise: Preliminary Report. P. Szekely, London, England.—p. 360.

Action of Calcium on Human Electrocardiogram. N. E. Clarke, Detroit.—p. 367.

*Experimental Studies on Effect of Temporary Occlusion of Coronary Arteries: II. Production of Myocardial Infarction. H. L. Blumgart, D. R. Gilligan and M. J. Schlesinger, Boston.—p. 374.

Fetal Electrocardiography. H. Mann and P. Bernstein, New York.—p. 390.

Wolf-Parkinson-White Syndrome, with Paroxysms of Ventricular Tachycardia. S. A. Levine and P. B. Beeson, Boston.—p. 401.

Blood Picture in Rheumatic Fever.—Wasson and her associates studied in detail the blood of 100 hospitalized children with acute rheumatic fever. The study reveals that blood determinations if frequently and accurately repeated give a correct index of the status of a rheumatic child. The study corroborates the prevailing opinion that the erythrocyte sedimentation rate is the most delicate nonspecific indication of rheumatic infection. However, allowance must be made for the premenstrual period and for acute anemia. The mean erythrocyte sedimentation rate of menstruating girls is higher than that of puberal girls and boys. When an infection of the upper part of the respiratory tract ushered in an attack of rheumatic fever, the erythrocyte sedimentation rate would rise and remain accelerated or it would continue to rise after the symptoms of the cold had subsided. Single erythrocyte sedimentation rates are of negligible, if of any, value. It takes the erythrocyte sedimentation rate on an average of two months to return to normal in acute rheumatic fever; if a rise becomes normal in a few days or even two weeks the patient has had an infection other than rheumatic fever. The nonfilamented neutrophil count is not so sensitive as the erythrocyte sedimentation rate, but it has the advantage that an increase in the nonfilamented cells always heralds an infection, and often a severe one. During acute attacks of rheumatic fever the nonfilamented cell count closely parallels the sedimentation rate, except in the terminal stages, when it returns to normal sooner. A normal Schilling count does not mean that infection is absent, but that the infection either is trivial or is just beginning and that as yet it has had no effect on the bone marrow. A single hemoglobin level determination is an unreliable standard of activity. Only the trend of the hemoglobin curve has significance. Of a total of eight hundred and twenty-three blood platelet counts, 66.93 per cent were below 200,000, and only 4.38 per cent above 250,000. This sharply subnormal platelet count in children subject to rheumatic fever characterizes the quiescent as well as the acute stage of the disease. An acute infection produced a sharp decrease in platelets only toward the end of the attack, and then a rapid rise. The bleeding and coagulation times had no diagnostic significance. Capillary resistance was important in the diagnosis of the rheumatic state. The lowest capillary resistances were observed in children who had had repeated attacks of epistaxis. The lowest erythropermeability occurred during the spring

months, when attacks of rheumatic fever are most frequent. The hemorrhagic tendency of the rheumatic state may be explained by (1) the generally low blood platelet level with further reduction during the acute phase and (2) the increased capillary erythropermeability of all patients with rheumatic fever, especially those prone to nosebleeds and acute attacks of fever.

Occlusion of Coronary Arteries.—According to Blumgart and his collaborators, experiments were performed on 39 dogs to learn whether temporary occlusion of a coronary artery would produce myocardial infarction and persistent electrocardiographic changes characteristic of myocardial ischemia. In 12 of 18 animals allowed to survive four or more days electrocardiographic changes typical of myocardial ischemia were found during the first few days to weeks after occlusion of a coronary artery for five to forty-five minutes. The type of change varied according to whether the occlusion was in the anterior descending or left circumflex artery. Eight animals died of ventricular fibrillation during the first five minutes of occlusion or when the circulation was reestablished after fifteen to thirty minutes of occlusion. No gross evidence of myocardial infarction was found in the 7 animals that lived for four to forty days after occlusion for five to twenty minutes. There was gross evidence, proved subsequently by microscopic examination, of infarction in 8 of 11 experiments in which occlusion was maintained for twenty-five to forty-five minutes. The extent of infarction was roughly in proportion to the duration of the arterial occlusion. The experiments indicate that temporary ischemia may cause irreversible myocardial changes and, if the ischemia is of sufficient duration, may cause myocardial infarction similar to that which occurs after permanent and complete occlusion of an artery. In man, pathologic observations indicate that an inadequate blood supply over a prolonged time may cause the same myocardial changes as complete ischemia of shorter duration. The focal areas of fibrosis commonly found in the hearts of patients with angina pectoris and those areas of the hearts of dogs subjected to temporary ischemia seem to have a common underlying pathologic physiologic mechanism. Angina pectoris is the clinical expression of temporary, relative, myocardial ischemia. The cardiac pain of some patients is more prolonged than that consistent with angina pectoris, but the clinical evidence of myocardial necrosis is absent and a diagnosis of angina pectoris or acute myocardial infarction would be erroneous. Coronary failure and angina pectoris seem to have the same physiologic basis. The experimental, clinical and pathologic data regarding "silent infarction" of the myocardium suggest that the areas of fibrosis were not completely occluded. The authors believe that the experimental data obtained are applicable to the phenomenon of cardiac infarction in the absence of complete occlusion of a coronary artery in man.

American J. Digestive Diseases, Fort Wayne, Ind.

8:321-360 (Sept.) 1941

- *Digestive Disorders in Soldiers. A. Hurst, London, England—p. 321
- Effect of Liquid and Solid Meals on Intestinal Activity. J. H. Grundlay and F. C. Mann, Rochester, Minn.—p. 324
- Acute Pancreatitis with Fat Necrosis. F. G. Connell, Oshkosh, Wis.—p. 327
- Relation of Nutrition to Gastric Function. III. Effect of Vitamin B Deficiency. Helen M. Dyer and J. H. Roe, Washington, D. C.—p. 329
- Relation of Nutrition to Gastric Function. IV. Effect of Vitamin A Deficiency. Helen M. Dyer and J. H. Roe, Washington, D. C.—p. 333
- Pancreatic Secretion in Man After Administration of Different Stimulants. Comparative Study. M. W. Comfort and A. E. Osterberg, Rochester, Minn.—p. 337
- *Hereditary Hemorrhagic Telangiectasia with Gastrointestinal Bleeding. D. E. Griggs and M. Q. Baker, Los Angeles—p. 344
- Comparison of Three Urobilinogen Tests in the Urine, (Watson, Sparkman and Wallace and Diamond Methods) in Jaundice and Diseases of Liver. F. W. White, A. P. Meiklejohn, E. Deutsch and R. Kark, Boston—p. 346
- Gastric Secretion in Enterectomized Dogs. J. S. Gray, J. A. Wells and A. C. Ivy, Chicago—p. 353
- Effect of Anoxemia and Oxygen Therapy on Flow of Bile and Urine in the Nembutalized Dog. II. Its Possible Relationship to Hepatorenal Syndrome. J. G. Schnedorf and T. G. Orr, Kansas City, Kan.—p. 356

Digestive Disorders in Soldiers.—Hurst points out that most soldiers admitted to hospitals in England for gastric or duodenal ulcer have had attacks before joining the army. The recurrence appears to be due to the change from the compara-

tively strict civilian diet to the heavy army food. Psychologic factors have had little, if any, importance in the British Expeditionary Force, but this was not true among soldiers serving in England. Symptoms recurred in 70 per cent within two months and often within a few days, and in the remainder within eight months after enlistment. Among soldiers with ulcer, the teeth of 38 per cent were inadequate for chewing. The author believes that no man who presents definite evidence of having had an ulcer should be accepted for service. He should be rejected even if he has been free of symptoms for a long time as the ulcer diathesis is always present and it makes him liable to recurrences especially when his strict civilian life is replaced by the comparative hardships of military service. Dyspepsia alone should not be a reason for rejection. Soldiers with mild dyspepsia should not be hospitalized but treated by reassurance and alkali mixtures by their regimental medical officers. Those with severe dyspepsia of long standing should be treated at hospitals, and when ulcer, gastritis, cholecystitis and other possible organic causes have been excluded, the dyspepsia can be regarded as functional, except in malingerers. The tendency in the army to call all functional gastric disorders "gastritis" is a mistake. Gastritis is an organic disease, it is most undesirable to confuse it with functional gastric disorders with no organic basis. If an ulcer is diagnosed the soldier should usually be invalided from the service. An exception may be made for officers and other men with important sedentary duties, for whom provision can be made for regular well cooked meals and intermediate feeds. Functional dyspepsia should be treated immediately and the soldier's ability to eat ordinary army food and face ordinary army life restored. The recognized malingerer should be sent back to duty. Delay in proper treatment and disposal is likely to produce "disordered action of the stomach" corresponding to "disordered action of the heart" or the "effort syndrome." Both conditions are genuine enough, but they are the product of bad treatment and not of army life. The author believes that much man power would be saved if special army units, as suggested by Schindler, staffed by medical officers experienced in gastroenterology, clinical pathologists and expert roentgenologists would be established. Such units would recognize at least 95 per cent of chronic gastric and duodenal ulcers. The unit should have three distinct divisions: division A for diagnosis, division B for patients suffering from organic disease and division C for those suffering from functional dyspepsia. A few patients admitted into division C might be hopelessly hypochondriacs, who should be discharged from the army without pensions.

Hereditary Hemorrhagic Telangiectasia.—Griggs and Baker report the 3 cases of multiple telangiectasia with gastrointestinal bleeding encountered at the Los Angeles County Hospital during the last twelve years. The diagnosis of hereditary hemorrhagic telangiectasia is usually not difficult, telangiectatic lesions on the skin and mucous membranes, the definite tendency for the lesions to bleed and a positive family history comprise the diagnostic criteria. Information regarding the family history of the first patient is meager, but a negative history would not militate against the diagnosis, since Fitz Hugh has pointed out that the disease may skip one or more generations. Two of the patients first noticed symptoms toward the end of the fourth decade. Gastrointestinal bleeding rarely occurs before this, but nasal bleeding is not unusual in the teens. The sexes are equally affected. The disease may be transmitted by either sex. The spleen of 1 patient and the spleen and liver of another patient were enlarged. The patient with the enlarged spleen had two severe transfusion reactions. The mortality of the disease is low, but death from spontaneous hemorrhages from a telangiectatic area may occur. Several instances of such deaths occurred in the families of the patients reported on. Severe bleeding is ascribed by Steiner to the absence of elastic tissue in the dilated vessels of telangiectatic areas. Familial multiple telangiectasia should be considered in all cases of obscure gastrointestinal bleeding. Gastrointestinal hemorrhage frequently causes abdominal discomfort. All 3 patients at times had some abdominal distress, especially during active bleeding.

American Journal of Diseases of Children, Chicago

62:481-700 (Sept) 1941

- Polyps of Rectum and Colon in Infants and Children R L J. Kennedy, Rochester, Minn.—p 481
- Granules in Leukocytes in Gargoylism W. A. Reilly, San Francisco—p 489
- Effect of Refined Antipertussis Rabbit Serum on Humoral Antibody Titer in Pertussis W. L. Bradford, H. W. Scherp and Anne M. Brooks, Rochester, N. Y.—p 492
- Study of Metabolism of Ingested Pectin. S. C. Werch and A. C. Ivy, Chicago.—p 499
- Domestic Water and Dental Caries. III. Fluorine in Human Saliva F. J. McClure, Washington, D. C.—p 512.
- Effect of Adding Vitamin B Complex to Diets of Stabilized Diabetic Children R. L. Jackson and Irene Barth, Iowa City—p 516
- *Sulfanilamide in Treatment of Acute Otitis Media in Children L. L. Braun, Chicago, and J. A. Bigler, Highland Park, Ill.—p 521
- Blood Cells in Healthy Young Infants. IV. Postnatal Readjustments of Red Blood Cells in Individual Babies. A. H. Washburn, Denver.—p 530
- *Reduction of Serum Reactions. Use of Antitoxins of Which Protein Specificity Has Been Altered by Enzymic Digestion F. H. Top and E. H. Watson, Detroit—p 548
- Cerebral Abscess and Paradoxical Embolism Associated with Congenital Heart Disease Report of Seven Cases, with Review of Literature R. Hanna, Los Angeles—p 555
- Magnesium Needs of Preschool Children Amy L. Daniels, with technical assistance of Gladys J. Everson and Margaret L. Cooper, Iowa City—p 568
- *Congenital Absence of Right Lung. Its Occurrence in Healthy Child. Emily L. Van Loon and S. Diamond, Philadelphia—p 584

Sulfanilamide for Otitis Media.—Braun and Bigler determined the value of chemotherapy for acute otitis media by treating half of 425 children with this condition with sulfanilamide and symptomatic treatment and the other half only by symptomatic treatment. The ages of the patients varied from 2 weeks to 13 years. Both ears of 238 patients were involved, so that 663 ears were treated. The average duration of otorrhea was eleven and fifty-eight hundredths days for the patients given sulfanilamide and twenty and forty-three hundredths days for the controls. Myringotomy, indicated by sustained fever, severe earache and bulging of the tympanic membrane, was performed on 33 of the patients treated with sulfanilamide and on 50 controls. The most significant difference among the two groups was the incidence of complications; there were 12 instances of surgically proved mastoiditis among the controls and only 4 among the patients given sulfanilamide. This made complicating mastoiditis three times as prevalent among the controls as among the specifically treated patients. There were no fatalities in either group. The results suggest that careful, adequate and sufficiently sustained sulfanilamide therapy should be tried early in all cases of acute otitis media.

Serum Reactions.—Top and Watson used "despeciated" diphtheria antitoxin for 61 patients and "despeciated" scarlet fever antitoxin for 69 patients. Despeciated indicates that the proteins of the antitoxin are so altered that specific biologic reactions to horse serum were prevented when tested on laboratory animals. The antitoxin molecule is altered only slightly, but the alteration is enough to change its biologic specificity without impairing its antitoxic or antibacterial properties or its potency. The authors' experience coincides with that of others who have used "despeciated" antitoxins in that they found that allergic reactions were greatly reduced. The immediate advantages of "despeciated" serums are threefold: 1. Most patients who are very sensitive to ordinary serums may now be treated effectively. 2. The incidence of all serum reactions can be greatly reduced. 3. It seems probable that serotherapy may now be given to certain patients to whom it was formerly denied. The question whether the hesitancy to use serotherapy in moderately severe scarlet fever because it may preclude the use of diphtheria or tetanus antitoxin later on is removed by "despeciated" antitoxins remains to be answered by additional clinical information, particularly by the tolerance of patients to the readministration of these antitoxins at intervals of months or years. Published reports indicate that the incidence of all reactions (allergic) with the use of the new antitoxins is less than 10 per cent as compared with a control incidence of 40.5 per cent among 2,675 cases reported by Fox and 43.6 per cent among 87 controls given regular antitoxin by Toomey and Kimball.

Absence of Right Lung.—Van Loon and Diamond report the case of an otherwise healthy child who presented unmistakable evidence of congenital absence of the right lung. Other than Munchmeyer's clinical diagnosis of unilateral pulmonary agenesis shortly before the death of his 2 year old male patient with pneumonia, subsequently verified at postmortem examination, the authors believe that theirs is the first clinically authentic case. Their patient is a girl 3½ years of age, with a normal developmental history, who except for several transient episodes of illness, characterized by a profuse nasal discharge, a mild cough and, at times, noisy breathing, has always been in excellent health. During one of these episodes of illness the first roentgenograms of the chest were made and their appearance prompted the attending physician to advise hospitalization for further study. At present there is no evidence that she has any other congenital anomaly. The pulmonary anomaly consists of absence of the right main stem bronchus and lung and narrowing of the lower end of the trachea. Roentgen study indicates that no pulmonary vessels are present on the right side, but proof must await demonstration at necropsy. The patient's prognosis, barring extensive disease of the left lung, appears to be good. There is no reason to believe that the child's future course will be adversely affected by her pulmonary aplasia. Heerup's report of a similar congenital defect in a woman of 72, who died of cerebral hemorrhage, indicates that the condition is compatible with longevity.

American Journal of Ophthalmology, Cincinnati

24:979-1104 (Sept.) 1941

- Biochemistry of Lens. XV. Studies on Swelling of Isolated Lens. J. G. Bellows and H. Chinn, Chicago—p 979
- Oculogenic Crises Therapeutic Approach. R. M. Klemme, St. Louis.—p 1000.
- Hyperostosis of Orbit W. L. Benedict, Rochester, Minn.—p 1005.
- Hereditary Craniofacial Dysostosis E. A. Vorisek, Chicago—p. 1014
- Management of Strabismus at the Milwaukee Children's Hospital. J. B. Hitz, Milwaukee—p 1019
- What Can Be Expected of Orthoptic Training? Edna Knauber, New York.—p 1022
- Gonioscopic Observations in Cyclodialysis Operations S. T. Clarke, Boston.—p. 1026
- Bitot's Spots in Trinidad. Vivian M. Metivier, Port of Spain, Island of Trinidad—p 1029
- Observations on Chemotherapy of Trachoma A. R. McKelvie, R. Kirk and H. J. Holder, Khartoum, Anglo Egyptian Sudan—p 1035
- Convergence Insufficiency. Beulah Cushman and Clara Burri, Chicago.—p 1044
- Wolffston and Hemianopsia J. E. Lebensohn, Chicago—p 1053.
- San Francisco Orthoptic Laboratory. Cooperative Establishment F. C. Cordes, San Francisco—p. 1057.

American Journal of Public Health, New York

31:905-1026 (Sept) 1941

- Administration of Medical Services as Part of Health Department Program D. L. Seckinger, Washington, D. C.—p 905
- Control of Venereal Diseases in Civilian Areas Adjacent to Concentrations of Armed Forces. A. B. Price and I. J. Weber, New Orleans.—p 912.
- Outbreak of Endemic Typhus Fever in Nashville, Tenn. Its Epidemiology and Control C. B. Tucker, T. V. Woodring and H. C. Essick, Savannah, Ga.—p 917
- Application of Epidemiologic Method to Study of Distribution of Medical Care J. J. Bourke and Margaret Bullowa, Albany, N. Y.—p. 926.
- *Human Equine Encephalomyelitis in Kern County, Calif., 1938, 1939 and 1940. W. C. Buss and Beatrice F. Howitt, San Francisco.—p 935.
- Epidemiology and Laboratory Diagnosis of Infectious Jaundice (Weil's Disease) J. G. Molner and J. A. Kasper, Detroit—p 945
- Tuberculosis Infection in Relation to Tuberculin Sensitivity in School Children Roentgenologic Evidence—Second Report R. S. Gass, W. J. Murphy, E. F. Harrison, Ruth R. Puffer, and W. C. Williams, Nashville, Tenn.—p 951
- Studies of Rebaking Cream Filled Pastries. F. W. Gilcreas and M. B. Coleman, Albany, N. Y.—p 956
- Types of Personnel in Public Health Statistics J. Sundwall, Ann Arbor, Mich.—p 959.
- Comparison of Undechlorinated and Dechlorinated Swimming Pool Waters C. A. Holmquist, Albany, N. Y.—p 961.
- Organization, Supervision and Objectives of Prenatal Medical Care. E. D. Plase, Iowa City—p 964

Human Equine Encephalomyelitis.—Buss and Howitt state that since 1939 a different point of view has obtained concerning the neurotropic diseases (equine encephalomyelitis and poliomyelitis) in Kern County, Calif. Although poliomyelitis predominated, an unexpectedly high proportion of the cases were equine encephalomyelitis and a few were the St. Louis type of encephalitis. This was demonstrated by serum neutralization

tests. A few remained undiagnosed. Thus it has been shown that more than one variety of neurotropic virus disease is prevalent in the county. In 1938 71 patients, in 1939 160 and in 1940 85 patients were admitted to the Kern County General Hospital with a tentative diagnosis of neurotropic virus disease. On the basis of neutralization tests, epidemiologic histories and clinical and laboratory observations 116 patients were segregated as having equine encephalomyelitis; 22 in 1938, 46 in 1939 and 48 in 1940. The western equine virus was recovered from the brains of 2 patients. Of 112 specimens of serum obtained during the three years from patients with a diagnosis of encephalitis, 97 (86.6 per cent) and of 82 specimens of serum from patients with a diagnosis of poliomyelitis 5 (6 per cent) neutralized the equine virus. Among 82 well contacts, the serum of only 6 (7.3 per cent) showed evidence of neutralizing ability; the serum of 5 was weakly positive and of 1 was strongly positive. The serum of 41 sick contacts was tested for neutralizing ability and that of 29 (70.7 per cent) was positive for the virus of equine encephalomyelitis. That so many of the sick contacts really had a mild form of the same disease is suggestive of a common source of infection or exposure to similar environmental conditions, especially as many of them lived on farms, in labor camps, in box cars or in small towns where there was an abundance of mosquitoes. Males were predominant among patients with poliomyelitis or encephalitis and the largest percentage of patients with a diagnosis of encephalomyelitis in all three years were children less than 10 years of age. Equine encephalomyelitis began about May, increasing to a peak in August in 1938 and 1939, and in July in 1940, and then it dropped off abruptly, with only a few cases through November. All cases were centered in the farming and irrigated areas in the central and western portions of the county. None were reported from the mountains or the eastern desert districts. Treatment during the acute and following stages of the disease was entirely nonspecific. For severe convulsions a variety of sedatives were used. During the comatose state parenteral fluids and gavage feedings were administered as required. Small transfusions and intramuscular injections of blood were given routinely. Physical therapy or casts were used for spasticity or weakness of the extremities. A periodic check of every patient followed discharge from the hospital. Recovery was apparently normal in all of them. Since 97 patients with encephalitis in Kern County during the last three years have given positive neutralization reactions against the western equine virus the evidence suggests that a permanent endemic area exists unless control measures are instituted.

Archives of Internal Medicine, Chicago

68:375-662 (Sept.) 1941

- *"Primary" Hypochromic Anemia Terminating in Pernicious Anemia. E. B. Miller and W. Dameshek, Boston.—p. 375.
- *Natural History of Bronchiectasis. A. G. Ogilvie, Newcastle-on-Tyne, England.—p. 395.
- Blood Pressure Studies on West Indians and Panamanians Living on the Isthmus of Panama. B. H. Keen, Ancon, Canal Zone.—p. 466.
- Transmission of Antianemic Principle Across the Placenta and Its Influence on Embryonic Erythropoiesis. O. P. Jones, Buffalo.—p. 476.
- State of Motor Centers in Circulatory Insufficiency. E. Simonson and N. Enzer, Milwaukee.—p. 498.
- *Acacia in Treatment of Nephrotic Syndrome, with Special Reference to Excretion of Chloride and Water. A. Goudsmit Jr., Philadelphia, M. W. Binger and N. M. Keith, Rochester, Minn.—p. 513.
- Diagnosis of Carcinoma of Pancreas. J. E. Berk, Philadelphia.—p. 525.
- *Primary Pulmonary Vascular Sclerosis. I. C. Brill and J. J. Krygier, Portland, Ore.—p. 560.
- *Response of Normal Subjects to Acute Blood Loss, with Special Reference to Mechanism of Restoration of Blood Volume. R. V. Ebert, E. A. Stead Jr. and J. G. Gibson 2d, Boston.—p. 578.
- *Clinical Lipoid Nephrosis. G. G. Gilbert, Durham, N. C.—p. 591.
- *Vascular Diseases: Seventh Annual Review. G. W. Scupham, G. de Takats, T. R. Van Dellen and J. H. Jesser, Chicago.—p. 599.

Hypochromic Anemia Terminating in Pernicious Anemia.—Miller and Dameshek cite 2 cases of "primary" or "idiopathic" hypochromic iron deficiency anemia which terminated in pernicious anemia. In the first patient, the Plummer-Vinson syndrome was present and the response to iron was good; typical pernicious anemia that responded to liver extract developed several years later. In the other patient, presenting an apparent typical primary hypochromic anemia, pernicious anemia developed after iron therapy. In this patient apparently

both iron deficiency and liver extract deficiency were simultaneously present and the iron therapy "unmasked" the underlying macrocytic anemia. Constitutional atrophic gastritis with gastric achlorhydria seemed to be present in the first patient. During a period of emotional stress, dysphagia appeared, and because of it a diet deficient in foods containing iron was taken and a chronic iron deficiency appeared. A few years later, probably as the result of functional or organic involvement of the pylorus, the intrinsic factor probably became greatly diminished and pernicious anemia resulted. Evidence in the literature seems to indicate that some persons possess a constitutional predisposition to gastric achlorhydria. This is often familial. During the stage of simple achlorhydria, hypochromic anemia may result, especially if another factor, such as dysphagia, inadequate diet, intestinal malabsorption or hemorrhage, is present. Occasionally the intrinsic factor of Castle may become seriously diminished and pernicious anemia result.

Development of Bronchiectasis.—Ogilvie discusses the natural development of bronchiectasis, in textbook style, under the headings of pathogenesis, etiology, clinical features, roentgenologic aspects, classification and prognosis. He presents an analysis of the condition in 68 patients whom he encountered during the last few years. The lobes of 28 were examined. A classification which recognizes congenital cystic disease of the lung and atelectatic and bronchogenic types of acquired bronchiectasis is suggested. The conclusion is reached that bronchial dilatation may be temporary or permanent. The first is always due to pulmonary collapse and the second is the result of the interaction of many factors, the most important of which is infection of the bronchial wall. The pathogenic factors in bronchiectasis fall under two heads: defects in the bronchial wall and excessive strain and stress to which the wall may be subjected. No conclusive evidence of the existence of congenital bronchiectasis, apart from congenital cystic disease of the lung, has been found as yet. An accurate history and careful physical examination are of utmost importance in the diagnosis of bronchiectasis, as in but few cases have physical signs been absent. The causes of death are classified into three groups: (1) local exacerbation or spread of infection within the lungs or the thoracic cavity, (2) direct complications of associated conditions and intercurrent disease and (3) dissemination of infection via the blood stream and the late results of chronic sepsis.

Acacia for Nephrotic Syndrome.—Goudsmit and his collaborators studied the chloride excretion of 4 nephrotic patients treated with acacia and 1 treated by a dietary regimen and potassium nitrate but no acacia. The major deficiency of renal excretion in the syndrome is in the elimination of sodium chloride and water. After injection of acacia usually considerably more water and sodium chloride were excreted in the urine. This increased excretion brought about a reversal of conditions which was significant and beneficial in comparison to untreated patients. Increases in the volume of the circulating blood or changes of colloid osmotic pressure appear to account for this change in renal function. Potassium salts, particularly potassium nitrate, also increase the amount of water and sodium chloride excreted. Acacia and potassium nitrate seem to remove the fluid of edema from a large percentage of adult patients with the nephrotic type of edema. The mechanism by which acacia increases this excretion is as yet unexplained. An analogous effect might be responsible for the diuretic effect.

Pulmonary Vascular Sclerosis.—Brill and Krygier report the twentieth case of primary pulmonary vascular sclerosis which fulfils Brenner's requirements: significant hypertrophy of only the right ventricle and the absence of any factors commonly believed to cause secondary pulmonary vascular sclerosis, pulmonary hypertension or strain of the right side of the heart. In their case the principal clinical manifestation was severe strain of the right side of the heart resulting in death. Pathologically definite isolated cor pulmonale was present, and the only lesion which might have been related to the fatal cor pulmonale was extensive sclerosis and occlusion of the pulmonary vascular tree. Clinically or pathologically only slight evidence of congestive heart failure was observed. More than a year prior to death the patient, while yet not 20, began to suffer from attacks of precordial pain. Sometimes the pain was

"not radiating," and the attacks were often associated with cyanosis. This is similar to the "hypercyanotic angina" which has been described, especially by the older writers on so-called Ayerza's disease, as occurring occasionally in severe chronic cor pulmonale. Although the coronary vessels were patent and free of sclerosis it appears probable that the sudden death and the earlier attacks of anginal pain were due to acute coronary insufficiency owing to the greatly diminished volume of blood delivered to the left ventricle. Theories concerning the cause and the pathogenesis are discussed, and especial reference is made to the possibility of an essential pulmonary hypertension being related to strain of the right side of the heart similar to that of essential systemic hypertension on the left side of the heart.

Effect of Acute Blood Loss on Normal Subjects.—Ebert and his collaborators determined the effect that the removal of 760 to 1,220 cc. of blood (15.5 to 19.7 per cent of the total blood volume) had on 6 professional blood donors. The blood was drawn in six to thirteen minutes. Collapse, characterized by weakness, nausea, blurred vision, pallor, sweating and fall in arterial pressure, developed in 5 of the 6 subjects. Before the onset of collapse the heart rate increased from 14 to 30 beats per minute above the basal level, but at its height the heart rate ranged from 36 to 40 beats per minute. The plasma volume began to increase immediately after hemorrhage and continued to do so for the next forty-eight to seventy-two hours, at the end of which it was approximately equal to that before hemorrhage plus the volume of erythrocytes withdrawn. During the first two hours after venesection the plasma volume was increased by protein-poor fluid decreasing the serum protein concentration. Thereafter, fluid and protein were added to the plasma and the serum protein remained unchanged, but the total circulating protein increased. Loss of blood acted as a physiologic stimulus for the production of normal protein, and the addition of new protein did not change the proportion of albumin and the various globulin fractions. The blood volume after hemorrhage was not restored to normal until new plasma protein was added to the circulation. Hematocrit readings accurately reflected the direction of a change in plasma volume.

Lipid Nephrosis.—Gilbert followed a typical case of lipid nephrosis for four years and then finally at necropsy. Nephritis with associated uremia developed terminally, and the anatomic changes characteristic of chronic glomerulonephritis were revealed at necropsy. During the four years the patient, a white child 5 years of age at death, was hospitalized thirteen times. On the final admission the clinical picture had changed to such an extent that the diagnosis of lipid nephrosis was no longer tenable, as all the typical signs and symptoms of chronic glomerulonephritis were present. The study supports the thesis that lipid nephrosis and chronic glomerulonephritis are not separate and distinct anatomic entities but merely different manifestations or phases of the same general pathologic process, that is, progressive failure of renal function.

Archives of Neurology and Psychiatry, Chicago

46:377-568 (Sept.) 1941

- Objective Measurement of Relative Intracranial Blood Flow in Man, with Observations Concerning Hydrodynamics of Craniovertebral System. E. B. Ferris Jr., Cincinnati.—p. 377.
- Corpus Striatum and Thalamus of Partially Decorticate Monkey. S. W. Ranson, S. W. Ranson Jr. and Mary Ranson, Chicago.—p. 402.
- Subcortical Hematoma: Surgical Treatment, with Report of Eight Cases. C. Pilcher, Nashville, Tenn.—p. 416.
- Hepatolenticular Degeneration: Report of Case. Charlotte G. Babcock and H. W. Brosin, Chicago.—p. 431.
- Multiple Meningioma: Removal of Ten Intracranial Tumors from a Patient. D. H. Echols, New Orleans.—p. 440.
- Vascular Malformations and Vascular Tumors Involving Spinal Cord: Pathologic Study of Forty-Six Cases. O. A. Turner and J. W. Kernohan, Rochester, Minn.—p. 444.
- Peripheral Neuropathy: Evaluation of Sensory Findings. M. H. Stein, H. Wortis and N. Joffe, New York.—p. 464.
- Tabs Dorsalis: Evaluation of Sensory Findings. M. H. Stein and H. Wortis, New York.—p. 471.
- Changes in Brain in Pertussis with Convulsions. Vera B. Dolgopel, New York.—p. 477.
- Observations on Monkeys with Bilateral Lesions of Globus Pallidus. S. W. Ranson and C. Berry, Chicago.—p. 504.

Bulletin of Johns Hopkins Hospital, Baltimore

69:225-296 (Sept.) 1941

- Pyruvate Oxidation and the Citric Acid Cycle. E. A. Evans Jr., Chicago.—p. 225.
- Electroencephalographic Changes Associated with Different Forms of Experimentally Produced Increased Intracranial Pressure. W. A. Stewart, New York.—p. 240.
- Failure of Pyridoxine (Vitamin B₆) to Modify the Parkinsonian Syndrome. W. H. Barker, H. J. Stein, M. H. Miller and M. M. Winthrope, Baltimore.—p. 266.
- Graphic Solution of the Dosage-Effect Curve. J. T. Litchfield Jr., Baltimore, and J. W. Fertig.—p. 276.
- Comparison of Ball-Mill and Coca Extracts of Ragweed Pollen in Treatment of Hay Fever. W. L. Winklerwerder, Baltimore; C. Arbesman, Buffalo, L. N. Gay and H. Eagle, Baltimore.—p. 287.

Georgia Medical Association Journal, Atlanta

30:297-336 (July) 1941

- Vaginal Smear as Guide to Estrogenic Therapy. R. B. Greenblatt, Augusta.—p. 297.
- Hypogonadism: Report of Case Showing Results Following Use of Neohomobrol. E. Floyd, J. L. Pittman and R. W. Edenfield, Atlanta.—p. 304.
- Cleveland Session of American Medical Association: Observations, Interpretations and a Little Homespun Medical Philosophy. C. W. Roberts, Atlanta.—p. 305.
- Plight of the Arthritic. R. L. Cecil, New York.—p. 318.
- Physician, Care for Thyself. E. A. Allen, Atlanta.—p. 325.

30:337-376 (Aug.) 1941

- Biliary Obstruction Complicating Hemorrhagic Disease of Newborn. J. T. Leslie and K. S. Hunt, Griffin.—p. 337.
- Analysis of 500 Incomplete Abortions. C. M. Mulherin, Augusta.—p. 342.
- Surgery of Spleen: Report of Cases. L. W. Grove, Atlanta.—p. 346.
- Chronic Hypoglycemia in Psychotic Patients Following Prolonged Insulin Shock Therapy: Preliminary Report. J. R. S. Mays and Y. H. Yarbrough, Milledgeville.—p. 353.
- Scalenus Anticus Syndrome (Brachial Neuritis): Report of Five Cases. E. Walker, Atlanta.—p. 356.
- Blackheads and Pimples: Attitude Toward Acne Vulgaris. H. S. Alden and J. W. Jones, Atlanta.—p. 359.

30:377-414 (Sept.) 1941

- Special Field of Cardiac Surgery. D. C. Elkin, Atlanta.—p. 377.
- Vulvovaginal Mycosis. F. R. Minnich, Atlanta.—p. 386.
- Intussusception Associated with Polyp in Meckel's Diverticulum: Report of Case. F. H. Brown, Jacksonville, Fla.—p. 390.
- Role of Liver in Surgical Risk. H. Acuff, Knoxville, Tenn.—p. 392.
- Vitamin D Therapy in Psoriasis. J. Krafka, Augusta.—p. 398.
- Tularemia Pneumonia: Report of Case. W. G. Elliott, Cuthbert.—p. 401.

Illinois Medical Journal, Chicago

80:172-264 (Sept.) 1941

- Anorexia Nervosa. R. F. Farquharson, Toronto, Canada.—p. 193.
- Treatment of Psychiatric States Following Pregnancy. S. H. Kraines, Chicago.—p. 200.
- *Are Present Day Quarantine Methods Archaic? A. L. Hoyne, Chicago.—p. 205.
- Use of Secalon in Pediatric Procedures. L. Breslow and H. G. Poncher, Chicago.—p. 210.
- Surgical Management of Ureteral Stone. E. W. White, Chicago.—p. 212.
- Early Diagnosis of Malignant Tumors of Female Genital Tract. F. R. Smith, New York.—p. 218.
- Role of Peritoneoscopy in Abdominal Surgery. J. C. T. Rogers, Urbana.—p. 222.
- Volvulus of Cecum. R. M. Norris, Jacksonville.—p. 228.
- Susceptibility to Paralysis in Poliomyelitis. W. L. Aycock, Boston.—p. 231.
- Congenital Hemolytic Jaundice. C. D. Branch, Peoria.—p. 235.
- Factors Influencing the End Results of Surgery for Duodenal Ulcer. J. R. Buchbinder, Chicago.—p. 239.
- Allergy to Therapeutic Substances. S. M. Feinberg, Chicago.—p. 244.
- Surgery of Carcinoma of Colon and Rectum. R. K. Gilchrist, Chicago.—p. 249.
- Observations on Coronary Syndrome. H. H. Cole, Springfield.—p. 252.

Feasibility of Present Quarantine Methods.—Hoyne states that the usual quarantine methods have failed and that the only foolproof method for suppressing contagious diseases is immunization. Vaccination against smallpox is the outstanding example in this field of endeavor. The value of diphtheria immunization closely follows that of vaccination against smallpox. There was no noticeable suppression of diphtheria until active immunization was introduced. The control of typhoid is another striking example of the value of active immunization. Provisions for the prevention of tetanus, scarlet fever and whooping cough may in time join the ranks. Placarding of the home of the patient with measles is of no scientific value and indirectly may do harm in that the dread of the red quarantine

sign and the possible economic hardship that may result often may cause the parents to hesitate to call a physician when medical attention is most needed. Scarlet fever has not been suppressed by present quarantine measures. Unlike measles, it does not occur in frequent waves of high and low incidence but maintains a comparatively even yearly prevalence. An explanation for this is probably the constant presence of scarlet fever carriers. This is true with respect to immune carriers, and it must occur also to an extensive degree among convalescent carriers arbitrarily quarantined in accordance with public health regulations. From the standpoint of control, it is doubtful that quarantining for poliomyelitis, whooping cough or chickenpox really accomplishes any good. Sometimes rules of quarantine are applied without knowing whether quarantine does any actual good. The author states that these remarks are not intended to belittle proper isolation of patients with communicable diseases. And, as it is neither possible nor feasible to undertake the hospitalization of all patients with contagious disease, proper isolation measures at home will be more readily carried out if the restrictions placed about the family are reasonable. The contagious disease patient should be segregated for the duration of his infectivity. Perhaps in the future contagious disease hospitals will be used primarily only for patients who are so severely ill that hospital care is required and for patients whose contagious disease demands strict quarantine. With these exceptions all other patients with the common contagious diseases may perhaps be isolated in their homes without danger to the community at large and without emblazoned signs proclaiming their misfortune. However, neither quarantine nor isolation but immunization and vaccination will suppress contagious diseases.

Iowa State Medical Society Journal, Des Moines

31:373-414 (Aug.) 1941

- Head Infections in Practice of Medicine. G. E. Shambaugh Jr., Chicago.—p. 373.
Vertigo. W. D. Abbott and H. Schuknecht, Des Moines.—p. 378.
Hospital Epidemiology. R. H. Heeren, Iowa City.—p. 385.
Diabetes Mellitus with Pancreatic Calculi and Malignant Endocarditis: Case Report. E. B. Winnett and J. W. Caldwell, Des Moines.—p. 388.
Retropositions and Incarceration of Pregnant Uterus. S. W. Barnett, Cedar Falls.—p. 390.
Chronic Inversion of Uterus: Case Report. Arline M. Beal, Davenport.—p. 392.

31:415-456 (Sept.) 1941

- More Common Nervous Diseases of Spinal Cord. A. Verbrugghen, Chicago.—p. 415.
Etiology and Treatment of Iron Deficiency Anemias. W. M. Fowler and Adelaide P. Barer, Iowa City.—p. 420.
Scapula Alata. W. E. Foley and J. Wolf, Davenport.—p. 424.
Clinical Aids in Diagnosis of Heart Diseases in General Practice. O. Neurath, Sigourney.—p. 426.
Acute Leukemia: Case Report. D. J. Haines, Des Moines.—p. 430.
Occurrence of Avian Tubercle Bacilli in Dressed Poultry. Helen E. Bliss and R. Rooks, Iowa City.—p. 432.
Influenza Meningitis Treated Successfully with Sulfathiazole. R. A. Patterson and R. C. Crumpton, Webster City.—p. 433.

Public Health Reports, Washington, D. C.

56:1777-1818 (Sept. 5) 1941

- *Diverse Etiology of Epidemic Influenza. E. H. Lennette, E. R. Rickard, G. K. Hirst and F. L. Horsfall Jr.—p. 1777.
New Industrial Skin Cleanser. L. Schwartz.—p. 1788.
Disabling Sickness Among 2,000 White Male Glass Workers. W. M. Gafafer.—p. 1791.
Ornithodoros Turicata: The Male; Feeding and Copulation Habits, Fertility, Span of Life and Transmission of Relapsing Fever Spirochetes. G. E. Davis.—p. 1799.
Two Strains of Endemic Typhus Fever Virus Isolated from Naturally Infected Chicken Fleas (Echinophaga Gallinacea). G. D. Brigham.—p. 1803.

Diverse Etiology of Epidemic Influenza.—Lennette and his associates present evidence which shows that acute phase serums were usually obtained between the first and fourth day after onset from patients who provided throat washings and from numerous other patients in each epidemic. Convalescent serums were obtained from the same patients between two and three weeks later. Throat washings were obtained during the first few days of illness from patients with representative and clinically typical influenza. The presence of influenza A or B virus in a throat washing was determined by inoculation of ferrets or Syrian hamsters. The animals' clinical course was

followed carefully. Ten to fourteen days after inoculation they were bled from the heart, and the serum so obtained was run in neutralization tests against approximately thirty 50 per cent mortality doses of influenza A or B virus. Neutralization and complement fixation tests with influenza A virus were carried out with acute phase and convalescent serums obtained from a number of representative cases in each of fifteen outbreaks occurring in six states in 1940 and 1941. In all but three of the outbreaks the evidence indicated that influenza A virus was causally related to more than 50 per cent of the cases studied. On the other hand, evidence that influenza B virus had caused infections was obtained in only 6 cases, in 4 of which there was also evidence of infection by influenza A virus. The many cases in which indication of infection by either virus was not obtained are striking, particularly as these cases were clinically indistinguishable from those in which no difficulty was encountered in establishing an etiologic diagnosis and they occurred simultaneously with the others in each outbreak. It is suggested that these cases (30 per cent of all cases studied) resulted from infection by an agent or agents as yet unknown but distinct from either influenza A or B virus. In these cases no increase in antibodies against either of the two known influenza viruses was demonstrable during convalescence, and throat washings from them, when inoculated into ferrets or hamsters, did not produce antibodies against either virus. On the basis of these completely negative data it seems logical to suggest that there exists at least one additional infectious agent, antigenically distinct from either influenza virus, capable of causing clinical influenza. Since even in single institutional outbreaks of influenza A, influenza B and influenza of unknown cause sometimes occurred simultaneously, it is suggested that epidemics of influenza may frequently have diverse causes. The fact that in a few cases a specific antibody response to both viruses was demonstrated suggests that simultaneous or almost simultaneous infection by the two agents occurred in these cases. Hereafter the finding that some cases in an influenza epidemic resulted from a certain virus will not be adequate evidence that the whole or the major part of the epidemic was due to the one virus, unless of course all the cases are adequately studied.

Southern Surgeon, Atlanta, Ga.

10:615-694 (Sept.) 1941

- Surgical Treatment of Adenomatosis of Colon. F. W. Rankin, Lexington, Ky.—p. 615.
Certain Anatomic and Physiologic Aspects of Intervertebral Disk. F. K. Bradford, Houston, Texas.—p. 623.
Treatment of Recent Compound Wounds. R. A. Griswold, Louisville, Ky.—p. 630.
Obstructive Jaundice Caused by Perforating Duodenal Ulcer. A. C. Scott Jr., Temple, Texas.—p. 637.
Chemotherapy of Infections of Central Nervous System. C. C. Nash, Dallas, Texas.—p. 648.
Duodenal Drainage in Diagnosis of Gallbladder Disease. H. C. Myers, Philippi, W. Va.—p. 653.
Indications for Surgery in Duodenal Ulcer. J. L. Bradfield, Dallas, Texas.—p. 663.
Cancer of Larynx: Diagnosis, Treatment and Results, with Observations on Relation of Benign Tumors to Cancer. G. Tucker, Philadelphia.—p. 671.
Use of Sulfanilamide Powder in Abdominal Surgery. Q. B. Lee, Wichita Falls, Texas.—p. 680.

Virginia Medical Monthly, Richmond

68:497-562 (Sept.) 1941

- Psychotherapy of Children. L. Kanner, Baltimore.—p. 498.
Dr. John Minson Galt and the Williamsburg Asylum. P. G. Hamlin, Williamsburg.—p. 502.
Cancer of Larynx. E. G. Gill, Roanoke.—p. 509.
Nickel Pectinate in Treatment of Peptic Ulcers. F. M. Horsley, Schuyler.—p. 512.
Cantharides Poisoning. J. P. Lynch, Richmond.—p. 513.
Anemia: Classification and Treatment. B. S. Leavell, University.—p. 515.
Surgical Treatment of Strabismus. W. P. McGuire, Winchester.—p. 522.
Incidence of Syphilis in Industrial Practice. R. Brittain and J. S. Pearson, Jewell Ridge.—p. 525.
Radical Resection of Pancreas for Cancer. M. H. Todd, Norfolk.—p. 526.
Aids in Diagnosis of Mental Retardation. A. E. Grigg, Haddonfield, N. J.—p. 528.
Gonadotropin Excretion During Menstrual Cycle. F. R. Woodward and R. J. Main, Richmond.—p. 530.
Some Responsibilities of Medical Profession. G. G. Hankins, Newport News.—p. 531.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Heart Journal, London

3:145-204 (July) 1941

- *Tricuspid Stenosis, with Particular Reference to Diagnosis and Prognosis. W. T. Cooke and P. D. White.—p. 147.
Idiopathic Cystic Medial Necrosis of Aorta. D. H. Davies.—p. 166.
Electrocardiogram of Stokes-Adams Attack. J. Parkinson, C. Papp and W. Evans.—p. 171.
Total Thyroidectomy for Heart Failure: Unusual Case. W. R. Trotter and K. C. Eden.—p. 200.

Tricuspid Stenosis.—Cooke and White studied 30 cases of stenosis of the tricuspid valve proved post mortem and 12 cases observed during life. In 3 of the 12 the diagnosis was confirmed by necropsy; in the other 9 patients, who are still alive, the disease almost certainly has been correctly diagnosed. The 30 cases were encountered among 4,300 in which necropsy was done, including 217 cases of rheumatic heart disease, in 47 of which the tricuspid valve was involved. In 17 of these the disease was probably of no clinical significance. Twenty-one patients were male and 21 female in the combined group of 33 patients on whom necropsy was done and 9 with clinical disease. The age of the patients at death ranged from 10 to 59 years. Disease of the tricuspid valve may be divided into two types: that occurring in the first three decades of life in patients who die of rheumatic fever and that in older patients in whom the mechanical factors induced by the lesions play an increasingly important part in death. The symptoms in the younger group were almost indistinguishable from those of rheumatic fever, but the course of the older group was characterized by relatively long survival after the appearance of congestive symptoms and signs indicative in most other circulatory disorders of death in the near future. Therefore, owing to the "safety valve" function of the tricuspid valve, older patients may live many years if severe rheumatic fever does not recur. No one sign is pathognomonic of stenosis of the tricuspid valve, but the signs in the order of their importance, especially in combination, are mid-diastolic murmur localized over the tricuspid area, chronic and well defined systolic pulsation of the deep jugular veins, ascites in the absence of pulmonary congestion, enlargement of the heart shadow to the right, deviation of the esophagus to the left, cyanosis and sometimes jaundice, enlargement of the liver with or without pulsation, persistently raised venous pressure and prolonged circulation time of the right side of the heart.

British Journal of Dermatology and Syphilis, London

53:231-268 (Aug.-Sept.) 1941

- Endocrine Factors in Acne Vulgaris. E. L. Cohen.—p. 231.
Molluscum Contagiosum and Sulfapyridine. J. Sommerville.—p. 255.

British Journal of Ophthalmology, London

25:397-460 (Sept.) 1941

- The Problem of Asthenopia. F. A. Williamson-Noble.—p. 397.
Special Case of Melanosis Fundi: Bilateral Congenital Group Pigmentation of Central Area. A. Loewenstein and Janet Steel.—p. 417.
Wernicke's Syndrome Complicating Pregnancy and Associated with Ocular Complications: Report of Case. G. Black.—p. 424.
Orbital Dermoid (Lined by Skin and Modified Conjunctiva). P. M. Moffatt.—p. 428.
Von Recklinghausen's Disease with Diffuse Neurofibromatosis of Choroid: Case. S. Robson, W. Blackwood and H. A. Cookson.—p. 431.
Primary Retinal Infiltration of Pale Pulverulent, Stellate and Purpuric Character and Accompanying Nephritis is a Pathognomonic Sign of Azotemic Anemia. H. Lagrange.—p. 443.

British Journal of Radiology, London

14:255-274 (Aug.) 1941

- Survey of Depth Dose Data. W. V. Mayneord and L. F. Lamerton.—p. 255.
Note on Depth Doses in Fields of Irregular Shape. J. R. Clarkson.—p. 265.
Breast Cancer: Study of Train of Events Which May Follow Radical Removal and Postoperative X-Ray Therapy. F. Roberts.—p. 269.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

48:421-548 (Aug.) 1941

- *Results of 500 Cases of Wertheim's Operation for Carcinoma of Cervix. V. Bonney.—p. 421.
Hydatidiform Degeneration of Placenta in Pregnancy of Twenty-Nine Weeks' Duration Associated with Normal Fetus: Case. H. H. F. Barns.—p. 436.
Early Involvement of Ovaries in Carcinoma of Body of Uterus. H. H. F. Barns.—p. 443.
Fetal Mortality in Postmaturity. S. G. Clayton.—p. 450.
Survey of Results of Repair and Amputation of Cervix. E. Solomons.—p. 461.
Cullen's Sign. S. Way.—p. 473.
Renin and Pregnancy: Experimental Study of Renal Pressor Substance in the Pregnant Animal. R. J. Kellar and J. K. Sutherland.—p. 487.
Infection of Bartholin's Gland with Bacillus Paratyphosus B. A. W. Purdie.—p. 495.
Localization of Placental Site by Tomography. O. Lloyd and E. Samuel.—p. 499.
Acute Inversion of Urinary Bladder During Parturition. O. S. Heyns.—p. 503.
Contributions to Gynecologic Pathology. B. Gilbert.—p. 508.
Precocious Puberty Due to Granulosa Cell Tumor of Ovary. C. J. Fuller and R. W. Smith.—p. 513.
Rupture of Uterus During Pregnancy. D. F. Anderson.—p. 518.
Leukoplakic Vulvitis Necessitating Cesarean Section. V. B. Green-Armstrong.—p. 521.
Intravaginal Technic for Manchester and Anterior Colporrhaphy Operations. P. Malpas.—p. 523.
Two Unusual Cases of Cesarean Section. J. D. S. Flew.—p. 526.
Four Patients Seen Since the Bombardment of London Showing Unusual Length of First Stage of Labor. R. C. Brown.—p. 529.

Wertheim's Operation.—Bonney performed 500 Wertheim operations for cervical carcinoma; the follow-up study for 415 covers ten years and that for the others eight years. Most of the patients were between 35 and 60, 36 were more than 60, 34 between 30 and 35 and only 10 less than 30. In only 17 was the growth a pure columnar cell adenocarcinoma; in the rest it was squamous cell, though a tendency to columnar formation was observed in some. The five year cure rate among the 500 women was 40 per cent, but if the 36 who were lost sight of or died of other diseases are deducted the rate was 43 per cent. The incidence of recurrence was 38 per cent, or 41 per cent if those lost sight of and dead of other diseases are deducted. About 65 per cent of the recurrences occurred within two years of the operation. Irradiation or excision of the secondary growth was uniformly unsuccessful. The operative death rate for the 500 patients was 14 per cent, or 70 deaths, death usually occurring within a few hours or days of the operation, in some cases within one or two weeks and in a few after many weeks. Among the 500 women there were 200 whose glands were involved. The five year cure rate for those whose glands were not involved was 53 per cent or 58 per cent if patients lost sight of and dead of other diseases are excluded; whereas for the others the respective percentages were 22 and 23. A similar contrast is exhibited in the operative mortality, respectively 10 and 20 per cent. The relative ten year cure rate for the 415 patients was 31 per cent, or 36 per cent if the 49 lost sight of and dead of other disease are deducted. The author believes that operation has three advantages over radium treatment: 1. It is much easier to conceal from the patient the nature of the disease. 2. Since all that can be done has been done at the operation and recurrence, if it comes, is incurable, subsequent visits are unnecessary and undesirable, as they may arouse suspicion. 3. Operation, unlike irradiation, cures a proportion of patients whose regional glands are cancerous when they present themselves. However, the choice depends on whether the ultimate skill is available.

Journal of Physiology, Cambridge

100:125-232 (Sept.) 1941

- Differentiation of (Amphibian) Water Balance Principle from Anti-diuretic Principle of Posterior Pituitary Gland. H. Heller.—p. 125.
Effect of Insulin Administration on Insulin Content of Pancreas. C. H. Best and R. E. Haist.—p. 142.
Observations on Relation of Histamine to Reactive Hyperemia. H. Kwiatkowski.—p. 147.
Afferent Discharges to Cerebral Cortex from Peripheral Sense Organs. E. D. Adrian.—p. 159.
Gaseous Tensions in Brain. F. C. Courtice.—p. 192.
Effect of Oxygen Lack on Cerebral Circulation. F. C. Courtice.—p. 198.
Photosensitizing Action of Buckwheat (Fagopyrum Esculentum). Harriette Chick and P. Ellinger.—p. 212.
Further Evidence Concerning Role of Hypothalamus in Induction of Ovulation in Rabbit Following Injections of Copper Acetate. G. W. Harris.—p. 231.

Anales de la Soc. de Puericultura, Buenos Aires

7:59-200 (April-June) 1941. Partial Index

*Liver Therapy in Diarrhea in Infants. J. E. Virasoro, F. J. Roca and F. Roca.—p. 114.

Liver Therapy in Diarrhea in Infants.—Virasoro and his collaborators report good results in the treatment of benign diarrhea of infants by injections of liver extract, which were given one every other day, up to a total of five to eight injections. The toxic conditions of the patients disappeared early in the course of the treatment. The number of colon bacilli in the feces diminished. The appetite, digestion and general condition of the patients improved. There was a rapid favorable response of the patients to diet and hygiene, with consequent increase of weight and permanent control of the disease. The authors believe that apparently benign diarrhea in infants is due to insufficiency of the liver. The condition results in the development of either chronic or recurrent gastrointestinal and nutritional disorders which may become acute and can be controlled by early administration of liver extract. The authors' article is a preliminary note. Fifteen cases are reported.

Klinische Wochenschrift, Berlin

20:433-464 (May 3) 1941

*New Observations on Depot Insulin in Treatment of Diabetes Mellitus. A. Schweers.—p. 433.

Vitamin Action of Unsaturated Fatty Acids. E. Schneider.—p. 437. Clinical Investigations with Orally Active Estradiol Compounds. W. Reifferscheid and G. Schmidt.—p. 440.

Acute Erythroblastosis and Erythroblastic Reaction. R. Stodtmeister.—p. 444.

Problem of Demonstrating Autogenous Cancerigenic Substances. H. Gummel.—p. 448.

Origin and Development of Arch-Shaped ST Interval and So-Called Intermediary Deflection and Their Connection with S-Axis. L. Ungvárny.—p. 449.

*Differential Diagnostic and Prognostic Significance of Repeated Parallel Determinations of Erythrocyte Sedimentation Speed, of Costa's Reaction and of Weltmann's Coagulation Band. O. Lippross and H. Engel.—p. 453.

Depot Insulin in Diabetes Mellitus.—Schweers discusses the retarded action of depot insulins, pointing out that there are three different types. In the first type insulin is combined with protamine and zinc, in the second with the vasoconstrictive hormone of the posterior lobe of the hypophysis, and in the third with substances which retard resorption. Exact comparative determination of the depot action requires hourly blood sugar controls; observations during a period of absolute fasting may lead to erroneous conclusions. Numerous clinical observations convinced the author that hypoglycemia can be avoided by the proper allotment of carbohydrates to the different meals. From three fifths to two thirds of the carbohydrates should be given at the midday meal and small amounts at the morning and evening meals. Acetonuria was especially favorably influenced by the depot insulin containing the hormone of the anterior lobe of the hypophysis. The addition of small quantities of zinc to the insulin to which comparatively large amounts of the hormone of the posterior hypophysis has been added makes it possible to retard the action to such an extent that a reduction of the blood sugar can be observed until the evening or even until the following morning. There was no clinical evidence that the hormone of the anterior lobe of the hypophysis influenced the smooth musculature (intestine, gallbladder, urinary tract) or the cardiovascular system. Elimination of water and sodium chloride was not noticeably affected; in a few cases the addition of the hormone of the posterior hypophysis even seemed to exert a favorable effect on the water and salt retention brought on by the insulin.

Erythrocyte Sedimentation, Costa's and Weltmann's Reactions.—Lippross and Engel cite shortcomings of the sedimentation reaction, as well as of Costa's and Weltmann's reactions. On the basis that the nonspecific reactions of Costa and of Weltmann are at least partly determined by other factors than is the sedimentation speed of the erythrocytes, they made two hundred parallel investigations with these three tests on 53 patients with various disturbances. They were able to show that parallel tests often clarify obscurities of the one or the

other of the reactions and provide a better insight than does the employment of only one of these tests. From the relative deviations of the simultaneously obtained results of all three reactions in the course of such diseases as pulmonary tuberculosis, chronic pneumonia, pulmonary abscess, endocarditis, chronic colitis, diseases of the liver and bile passages, thyrotoxicosis, pernicious anemia, leukemia and neoplasms, it was often possible to draw differential diagnostic and prognostic conclusions. The authors recommend parallel determinations of the three tests.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

81:1001-1080 (May 13) 1941

*Studies on Rabies. Maria J. Otten-Van Stockum.—p. 1002.

Studies on Rabies.—Otten-Van Stockum discusses the results in rabies of using a living, formaldehyde treated, fixed virus from monkeys. She also presents experimental studies with formaldehyde treated vaccine and comparative results with phenolized vaccine. She concludes that the mortality from rabies among treated subjects is worthless as a basis for the estimation of the effect of a treatment unless the incubation period is taken into consideration, that is the time that has elapsed between the bite and the onset of the treatment. If account is taken of this, all known methods of treatment fail and only the fixed virus from monkeys, either living or killed by formaldehyde, produces satisfactory results. This is corroborated in animal experiments, provided certain precautions are taken. Experimental investigations carried out over a period of years demonstrated that the efficacy of a fixed virus vaccine is determined by the species of animal used for the preparation of the vaccine as well as by the nature and concentration of the employed rabicidal agent. In using monkey brains (in 10 per cent emulsion) and a 0.15 per cent solution of formaldehyde, with five days' incubation at 37 C. (98.6 F.), a fixed virus vaccine is obtained which proves highly effective in animal experiments as well as in the treatment of human beings.

Acta Obst. et Gynec. Scandinav., Stockholm

21:105-198 (No. 2) 1941

Endocrine Treatment of Amenorrhea. A. Westman.—p. 105.

Pathogenesis of External Endometriosis: Remarks on Behavior of Epithelial Cells on Heterotopic Mucosa. C. von Numers.—p. 151.

Observations on Early Getting Up After Gynecologic Operations or Deliveries. P. Vara.—p. 168.

*Histidinuria, Rapid Method for Detection of Pregnancy. V. Westberg.—p. 180.

Histidinuria, a Rapid Method for Determination of Pregnancy.—Westberg presents a short survey of the chemical properties of histidine and of the various reactions for demonstrating it. He gives particular attention to the methods of Kapeller-Adler (*Wien. klin. Wchnschr.* 47:168 [Feb. 9] 1934; abstr. *THE JOURNAL*, April 14, 1934, p. 1265; *Klin. Wchnschr.* 15:1728 [Nov. 21] 1936; abstr. *THE JOURNAL*, Jan. 23, 1937, p. 341), which he employed in his own studies. Chloroform is quite satisfactory as a means of preserving histidine in the urine. The author's studies were made on specimens of urine from more than 1,000 persons. These included 680 women with intrauterine pregnancy, 11 with extrauterine pregnancy, 61 who had had an abortion, 238 nonpregnant women, 19 men with pulmonary tuberculosis and 3 with Cushing's syndrome. On 14 women in the puerperium serial tests were made. The histidine reaction was negative in 6.34 per cent of the women with normal pregnancy; however, there were only 3.26 per cent of negative reactions among the women who were in the first three months of pregnancy. The histidine reaction was positive for all women with extrauterine pregnancy. The urine of nonpregnant women and of men gave positive reactions in 1.55 per cent of the cases. Histidine is eliminated during the earliest stage of pregnancy; in 7 cases the reaction was already positive before one menstruation had been missed. The serial tests on women in the puerperium disclosed that the secretion of histidine decreases rapidly after normal delivery; the same seems to be true after induced abortion. Comparative mouse, rabbit and histidine tests in 171 cases seemed to indicate that the histidine reaction can compete with the mouse and rabbit tests.

Book Notices

Accidental Injuries: The Medico-Legal Aspects of Workmen's Compensation and Public Liability. By Henry H. Kessler, M.D., Ph.D., F.A.C.S., Medical Director, New Jersey Rehabilitation Clinic, Newark. Second edition. Cloth. Price, \$10. Pp. 803, with 202 illustrations. Philadelphia: Lea & Febiger, 1941.

Ever since workmen's compensation enactments forced on the physician the unenviable job of estimating work capacity or earning power after injury, the medical profession has sought to establish some element of uniformity in disability evaluation. Certainly the first edition of *Accidental Injuries* should be regarded as one of the earliest and longest steps taken to eliminate guesswork and to substitute dependable and rational standards to which all concerned with indemnification for injury might look for authoritative guidance. The solution of these medico-legal problems is about the most elusive in the whole socio-economic field, but books of this kind do hold out some hope that eventually administrative methods can be so reorganized as to allow medical testimony to be offered in personal injury cases with every incentive to be candid and unbiased rather than the exact reverse. Only the full title of the book gives complete insight into the extensive character of its subject matter, since it does treat of the whole field of medicolegal relationships in workmen's compensation and public liability. Relatively little discussion is assigned to diagnosis and treatment as such, although there are a great many comments directed at differentiating between actual as against spurious physical impairment. The present revision does not depart in any considerable degree from the plan of the earlier work. The introductory chapters define and classify the motivation for workmen's compensation and the varying aspects of practical application in our states and territories. Many of the observations in these chapters and in those devoted to the physiology and pathology of trauma are in the author's characteristic philosophic vein. Kessler points out that, although not originally so intended, workmen's compensation contained within it the seed for all subsequent social security legislation—sickness, accident, unemployment and old age insurance. To be sure, it has required the connivance of physician, lawyer, administrator and beneficiary to accomplish this result, both designedly and unwittingly. Every one agrees that such things ought not to be, but the weight of custom and procedure has prevented easy transition to better, fairer and more effective administration. Certainly, one element of reform long overdue is the elimination of prolonged medical controversy in the presence of the claimant, which condition in certain jurisdictions is already being partially corrected through reliance on experienced medical advisory personnel.

The chapters discussing disability in relation to specific or anatomic parts or regions and in relation to the occupational diseases likewise follow the original method of organization. Dr. Andrew Rados has rewritten the chapter on the eye and has incorporated in full the report of the Committee on Compensation for Eye Injuries of the American Medical Association as the standard method of adjudging visual impairment.

Throughout the book are numerous pertinent citations indicating the present trend of decisions in workmen's compensation administration which are an additional reflection of extensive clinical and medicolegal experience developed through long association with the New Jersey Workmen's Compensation Bureau and the New Jersey Rehabilitation Clinic. Certainly no one who reads this work can escape the clear implication that workmen's compensation does not realize a complete social objective through programs of accident prevention and indemnification alone but through the reestablishment of the disabled worker quickly and competently as a self-sustaining unit in the community.

Medicinal Herbs and Their Cultivation. Ministry of Agriculture and Fisheries, Bulletin No. 121. Paper. Price 6d. Pp. 22. London: His Majesty's Stationery Office, 1941.

The importation into England of crude drugs has been seriously curtailed by the war. This booklet is intended to supply information relating to medicinal plants for which there is an urgent demand and which can be grown in that country. In

the foreword appears a statement that a scheme under theegis of the Ministry of Health has been formulated to increase home grown supplies of digitalis, henbane, belladonna and stramonium. In twenty-two pages the booklet discusses briefly the characteristics, cultivation and harvesting of sixteen cultivated herbs, nine wild herbs and seven so-called oil-containing herbs. While some important drugs are included in these lists, it is difficult to understand why in times of emergency agricultural resources and industry should be devoted to the cultivation of such items as aconite, chamomile, pennyroyal, peppermint, valerian, dandelion, buckthorn, elder flowers, comfrey, coriander, parsley, anise and fennel. Somebody in the Ministry of Agriculture and Fisheries appears to have been badly advised on therapeutics, and it would seem the course of wisdom to concentrate any surplus acreage on the growth of digitalis, belladonna, opium, poppy and stramonium, among others.

The Care of the Aged (Geriatrics). By Malford W. Thewlis, M.D., Attending Specialist, General Medicine, United States Public Health Hospitals, New York City. Third edition. Cloth. Price, \$6. Pp. 579, with 50 illustrations. St. Louis: C. V. Mosby Company, 1941.

Specialization in medicine proceeds at a swift pace. Not only has the human body been subdivided into anatomic regions and disease entities, but in pediatrics and geriatrics we find the development of specialties by segmentation of the life span. The specialty of pediatrics, which may be said to have started somewhere in the vicinity of 1860 through the inspiration of Jacobi, has thus far outstripped geriatrics in importance. Geriatrics, like old Rip Van Winkle, is just beginning to awaken from a long slumber. While the renewal of interest in this subject has been ascribed to the increase in the life span, it is more likely a direct expression of the fact that medicine as a science is growing up and getting older too.

Nascher was the first to write a textbook of geriatrics. His book appeared in 1914. The first edition of this book was published in 1919. The present volume is an extensive rewriting of the second edition, which appeared seventeen years ago. The book, as the name suggests, is a guide for those who are directly concerned with the practical care of the aged. It does not pretend to be a scientific treatise on the fundamental mechanisms of the aging process. Essentially the author has taken the common knowledge of medical science and applied it with uncommon good sense to the understanding and treatment of the manifestations of senescence. It is gratifying to know that many of the recently christened advances in scientific knowledge and therapeutics are recognized in a book devoted to the veneration and preservation of the aged. For instance, the theory of Goldblatt on the etiology of hypertension is included; the sulfonamide drugs up to and including sulfathiazole are employed in the recommended therapeutics; the technic of making cutaneous tests with polysaccharides of pneumococci as well as the newer atropine-like synthetics are discussed.

Throughout the volume one finds the most gratifying examples of balanced judgment and common sense; the section on the treatment of arthritis and the last section of the book, entitled "The Mathematical Angle," are conspicuously so. On the other hand it is a curious thing to find hand in hand with so many excellent presentations other material that is either outmoded or open to serious criticism. For instance, the author refers to pernicious anemia, diabetes, hyperthyroidism and leukemia as diseases of exhaustion. He states that liver extract by mouth is said to be of benefit for amebiasis. Laxatives containing sulfur are recommended as the drug of choice in the treatment of constipation associated with hemorrhoids. The author retains the refuted notion that there is something mysterious about obesity. He says "It is not always a question of overindulgence of food, since reduction in food does not always control obesity." In the treatment of severe diabetes crystalline insulin is recommended "if quick action is required," contrary to the best opinion on the subject. The statement that "High caloric diets cause increased endocrine activity, in particular, a high carbohydrate intake affects the islets and a high protein diet puts a 'strain' on the thyroid gland" is subject to serious question. An outstanding departure from the present day expert consensus is the chapter on fibrositis. The author uses this term to include such conditions as "bursitis, lum-

bago, muscular rheumatism, neuritis, panniculitis, sciatica and myalgia." Among the causes of "fibrositis" the author lists indiscretions in diet and vitamin deficiencies as well as describing a relationship to loss of sodium chloride during vigorous exercise. One gets the impression from the book that alcohol is an unmitigated evil. For instance, "alcohol increases the appetite by dulling the brain; thus distention of the stomach may exist without the patient's being aware of it." One is reminded of the remark ascribed to Dr. Llewellys Barker the elder that a man who takes alcohol regularly below the age of 40 is a fool but the man over 40 who takes none is a bigger fool.

Despite the relatively few faults, the volume will be found decidedly worth while by those who are engaged in the care of the aged. The flaws are in its theoretical and technical fine points, not in the practical information and common sense on which its usefulness will rest.

Physical Therapy for Nurses. By Richard Kovács, M.D., Clinical Professor and Director of Physical Therapy, New York Polyclinic Medical School and Hospital, New York. Second edition. Cloth. Price, \$3.25. Pp. 335, with 99 illustrations. Philadelphia: Lea & Febiger, 1940.

A review of the earlier edition in these columns discussed in suitable detail the merits of a nontechnical exposition which attempted to orient those employed as special aids in the administration of physical therapy. Popular demand for this informative textbook has provided the author with that looked for opportunity to arrange and improve its contents in accordance with accepted trends and progress in the field. This edition therefore is not only enlarged and revised but shows an increasing maturity in presenting the essential knowledge of electrophysics and biophysics suitable for the average nurse as a background to her training in the application of physical measures. The work is essentially a manual for nurses and provides concise evaluation of the nature and physiologic effects of certain physical and mechanical forces for therapeutic purposes. The text embraces the clinical action of heat, light, electricity, hydriatics, massage and exercise, measures which in their therapeutic detail are now recognized to require efficient assistance for their successful execution. That the subject matter has been materially enlarged is indicated by the addition of four new chapters which review the historical background of this discipline and evaluate the benefits and limitations of short wave diathermy, artificial fever therapy and colonic irrigation. Throughout these new chapters and the revised text, the virtue which commends itself foremost is the clarity of diction and the absence of padding. An object example is the compact exposition of the section on exercise, written by Dr. McGuinness, and because perfection has been closely approached throughout this volume, a single flaw that tends to mar this contribution, as a painful anachronism is found in the chapter on the history of physical therapy. It is choppy in style and often lacks that critical balance of statements authenticated by fact. Historians certainly will question the assertion which by innuendo credits the discovery of the physiologic action of the high frequency current to Tesla, when as a matter of fact d'Arsonval is credited with its discovery and first enunciation on Feb. 24, 1891. Nor will the student of this discipline consider its history complete without a review of the work of Franklin and Morton in the field of electrophysics. It is because of the general excellence of this work that the hope is advanced that its next edition will overcome the few loose ends in an otherwise valuable contribution.

Traffic in Opium and Other Dangerous Drugs for the Year Ended December 31, 1940. Report by the Government of the United States of America. U. S. Treasury Department, Bureau of Narcotics. Paper. Price, 25 cents. Pp. 105, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The immigration laws were amended on June 28, 1940 to provide for the deportation of any alien convicted of violation of any narcotic drug or marihuana law in the United States. Drug addiction in this country is steadily decreasing. The number of nonmedical drug addicts known is estimated at not more than one in every three thousand of population, a reduction of at least 66 per cent in the last twenty years. The decrease in the amount of ships reaching this country from

abroad in the last two years, on account of the war, has been a factor in the decrease in the drug traffic. Actual deportations were accomplished during 1940 in only thirty-six instances, as compared with fifty-three deportations in the previous year. Secretary of the Treasury Henry Morganthau Jr. had the foresight to obtain for the United States a three year supply of crude opium for medical needs before the Mediterranean Sea was closed to shipping on account of the war. From this reserve the United States Treasury Department has also supplied narcotic drugs for the sick and injured of the many other countries whose supplies have been cut off because of the war.

The largest individual seizure of prepared opium occurred in the Philippine Islands and the next in importance in San Francisco, the amounts seized having been 15,670 and 6,879 Gm. respectively. Raw opium is still scarce in the illicit traffic, and in the latter half of the year the price remained rather constant at \$300 for 1 pound bricks. Peddlers often demanded at San Francisco as much as \$2 a grain for prepared opium. The shortage of all drugs of addiction in the illicit traffic was further evidenced by the increasing number of thefts of these drugs from drug stores and drug manufacturers and by the forging of prescriptions. There was an increase, however, in the smuggling of marihuana into the United States by seamen on boats touching Central and South American ports, as well as an increase in the smuggling of marihuana over the Mexican border. Several of the most horrible crimes committed by persons under the influence of marihuana are reviewed in this report.

The shortage of narcotic drugs has caused addicts and pedlers to make additional efforts to divert narcotics from medicinal sources. This fact has also led to a greatly increased consumption of paregoric. The case is cited of a druggist who did a moderate regular business. A check of his records, however, indicated that he had sold over 321 gallons of paregoric in two years. The druggist pleaded guilty to violation of narcotics laws and was sentenced to a year and a day in prison, fined \$25 and placed on probation for five years. A doctor in Oklahoma in less than two years had purchased 19,500 quarter-grain tablets of morphine sulfate, and of these only 1,497 could be accounted for as having been administered by nurses in the hospital with which he was connected. This doctor was convicted and sentenced to three years in prison and fined \$1,000. A doctor in Arkansas engaged in the illicit drug traffic in cooperation with two druggists. In nine months the drug store purchased 38,000 morphine tablets and in the same period the doctor had written prescriptions calling for 31,667 morphine tablets, all of which prescriptions were filled at this drug store. This doctor was sentenced to two years in the penitentiary and will be placed on probation for five years after he gets out. The two druggists also were sentenced to the penitentiary.

Officials of the Bureau of Narcotics delivered addresses on request in all parts of the country in a preventive educational effort to discourage the use of narcotics, particularly marihuana. Too much encouragement should not be taken from the present decrease in smuggling and importation of narcotic drugs, as the war situation readily accounts for much of the decrease. A resumption of the illicit traffic may be expected when shipping becomes more normal and the boundaries between the various countries can be crossed more readily.

Hospitals Under Fire but the Lamp Still Burns. Edited by George C. Curnock. Cloth. Price, 7s. 6d. Pp. 148, with 32 illustrations. London: George Allen & Unwin Ltd., 1941.

This little book does not attempt to give a full account of the bombing of British hospitals. It does, however, reflect to some extent the effects of bombing on institutions which care for women and children as well as for others, and it does reflect also the manner in which the people of London responded to the attacks that were made on them. The book is replete with illustrations and with anecdotes and is supplemented with a list of the heroes and heroines who were recognized with Distinguished Service medals and with other decorations for their heroic activities during the bombing of the hospitals. Obviously, unless one has been in immediate contact with such hazards it is almost impossible to appreciate the serious conditions that eventuate.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LONG-STANDING SYPHILITIC INFECTION

To the Editor:—An obese Negro woman aged 35 complained of backache with radiation down the outer portion of the right leg and aching pain in the knees. General physical examination showed no abnormalities other than obesity and Argyll Robertson pupils. Tests of blood specimens taken at this time gave the following results: Kahn reaction, positive; Wassermann reaction, anticomplementary. Blood specimens sent to two other laboratories also showed a positive serologic reaction. Spinal puncture was attempted, but I was unable to reach the subdural space with the longest needle available, so that data on the spinal fluid are lacking. Roentgenograms of the lumbar portion of the spine reveal arthritic changes, and the backache complained of is not typical of tabes dorsalis. The patient states that eight years ago, at the time of a laparotomy, she was told that her blood was "O. K." She has never had treatment for syphilis, and there is no history of primary or of secondary lesions. I am unable to find any open lesions now. She is employed as maid and governess in care of two children and was so employed for two years before consulting me. Will you kindly advise me on the following points: 1. What is my obligation as to informing her employer of her condition? The patient herself has told the family that she must take treatments for impurities of the blood. 2. Will you kindly outline a suggested plan of treatment? Intravenous therapy will be difficult if not impossible because of the obesity.

M.D., Illinois.

ANSWER.—1. Although this patient's blood is said to have been normal eight years ago, the presence of Argyll Robertson pupils is a strong indication that the syphilitic infection is of long standing and therefore noninfectious. Under these circumstances the inquirer has no obligation to inform the patient's employer of the diagnosis, and to do so would probably be most unwise because of the possibility of creating syphilophobia in the employer's family.

2. A plan of treatment is difficult to outline without knowledge of the condition of the spinal fluid. In spite of the failure to obtain the spinal fluid on a first attempt, another effort should be made. Obesity is not an adequate reason for failure to secure spinal fluid, since extra long needles for lumbar puncture are available. If tests of the spinal fluid suggest that the patient has parenchymatous neurosyphilis (i. e. if the paretic formula is present) it would probably be desirable, in view of the potential difficulty of administering intravenous treatment, to initiate antisyphilitic treatment with quartan malaria. The quartan strain is suggested because a high proportion of Negroes are immune to tertian malaria. If, on the other hand, the spinal fluid shows only minimal or moderate abnormalities, it is suggested, in view of the difficulty of intravenous treatment, that six months to a year of treatment be initiated with courses of biweekly intramuscular injections of bismarsen (twenty to the course, dose 0.2 Gm.) alternated with courses of ten to twelve weekly intramuscular injections, each 0.2 Gm., of bismuth subsalicylate. At the end of six months to a year of this sort of treatment the spinal fluid should be reexamined and further treatment based on the results.

The chemotherapy suggested is also satisfactory as follow-up treatment for fever therapy with quartan malaria, should the latter prove necessary.

ESTRADIOL DOSAGE

To the Editor:—The Journal for March 22 contained an article by E. L. Sevringhaus on the value of estradiol as compared to similar substances. Does 600 biologic units represent an average dose? How often can that be given to women weighing 115-140 pounds (52-63.5 Kg.) whose sole symptoms are repeated flushings, say twelve in the twenty-four hours? Mild attacks of vertigo at infrequent intervals seem to be associated.

William T. Clarke, M.D., Los Angeles.

ANSWER.—The most potent tablet of estradiol for oral use contains 0.5 mg. and is labeled as giving 600 active biologic units. The milligram equivalent of this number of biologic units has varied in the past, but recently this figure apparently has represented a stable relationship. It should be realized that bioassays of estrogens vary considerably in the hands of different investigators or laboratories. The maximum tolerated dose of this material has never been determined or reported, but the use of 8 tablets daily, given 2 at a dose, is well known to be tolerated as well as useful in certain cases. Doses as low as 50 active biologic units have been employed but seem of little clinical value. The actual dosage for a given patient must be determined by trial as with many other estrogens.

INTRACTABLE PAIN ABOVE SYMPHYSIS PUBIS AFTER HYSTERECTOMY

To the Editor:—A white woman aged 27 had a hysterectomy some twenty-one months ago because of chronic pelvic inflammatory disease. Since that time she has gone to bed and refused to get up and walk, stating that the pain she suffers when on her feet is unbearable. The pain is about 1½ inches above the symphysis pubis, not in the skin or muscle, but it seems deeper. She says that the area of pain is about the size of the palm of one's hand and is constant and burning in character and not referred. I am of the opinion that she has a psychoneurosis but am convinced that she will never get up and walk unless this area is desensitized, for she has a definite phobia concerning it. Is there any method of nerve section or block that would be permanent and still not be too destructive? Please give me what information you can.

John T. Mosley, M.D., Winfield, La.

ANSWER.—There appears to be a psychoneurotic element in the pain of which this patient complains, but everything possible should be done to rule out an organic basis. Since the pain is deep rather than superficial, it is worth while to inject the sympathetic nerves around the cervix. This is a chemical sympathectomy based on the surgical type of pelvic sympathectomy, which has proved to be helpful in cases of dysmenorrhea. The technic of injecting the sympathetic nerve plexus around the cervix is as follows:

The patient is placed in the lithotomy position and an intravenous or gas anesthetic given. The cervix is grasped with volsella and retracted to the right side. A lateral retractor placed in the left fornix will expose this area. A long needle attached to a syringe containing 85 per cent alcohol is passed horizontally through the vaginal mucosa alongside the cervix for a distance of 0.5 cm. The retractor is removed. The needle is then passed backward and outward for a distance of about 1.5 cm. at an angle of 45 degrees to both the sagittal and coronal plane to a point about 0.5 cm. from the side of the rectal ampulla. A finger in the rectum guides the needle to the proper place. After the needle reaches this site, it is withdrawn about 0.5 cm. and 1 cc. of the alcohol solution is injected. While this is being done the needle is kept slightly but constantly in motion. The needle is withdrawn entirely and the same procedure is carried out in the other fornix. Not more than 1 cc. of 85 per cent alcohol should be used on each side, because a larger amount may injure the nerve fibers which control bladder function. The alcohol injures the sympathetic nerves and thereby interrupts the sensory pathways.

PHLEBITIS WITH ITCHING AND EXCESSIVE HAIR

To the Editor:—About five months ago a woman aged 68 had phlebitis in the left leg. The occluded vein extended from the mid thigh, curving down and around to the outside and back of the knee. Now the patient complains of an itching skin area. This area is behind and on the outside of the left knee, and the occluded vein goes down to and through this area. A striking feature of this case is that there is a growth of long hair following right over the curving occluded vein. This line of hair extends for about 12 inches exactly following the vein. The rest of the leg and the right leg are entirely devoid of hair. I should like to know if this is at all unusual and what the explanation might be. What treatment could be suggested for the itching, which apparently is due to this condition?

M. E. Monroe, M.D., Hartford, Wis.

ANSWER.—This is an unusual case; in fact, only 1 case of this kind has been found on record. Louste and Levy-Franckel (*Bull. Soc. de dermat. et de syph.* 36:77, 1929) treated a woman aged 44 for a mild psoriasis and a varicosity in the right leg and thigh. She had had a hysterectomy at the age of 33 followed by artificial menopause. The dilated vein was injected three times in three weeks with a solution of sodium salicylate. When she returned over two months later, the vein was partly sclerosed and over it, extending from the lower part of the external surface of the thigh to the apex of Scarpa's triangle, was a narrow band of pigmented skin covered by hair. Other cases in which pigmented bands developed subsequent to chemical thrombosis have been recorded, but none in which hair grew. Louste and Levy-Franckel discuss the possible pathogenesis of the phenomenon and favor the view that it is due to a local dysfunction of the vegetative nervous system. They promised further reports on their projected research but these have not appeared, possibly because they could not reproduce the phenomenon. The condition cited in the query should be photographed, studied as carefully as possible and reported.

The itching can be mitigated by calamine lotion containing 0.5 per cent phenol and glycerin dabbed on as often as needed, or 1 per cent or more of menthol can be used in place of the phenol but not with it, for these two drugs neutralize each other. An alcoholic lotion containing 1 per cent phenol or several per cent of menthol may be more helpful, or solution of coal tar, N. F., may be used in the same manner.

WOOL UNDERCLOTHING FOR INFANTS

To the Editor:—Would you give an opinion about the use of wool for children in this climate (it is damp, the community is situated near the sea and it is cold at night)? I have had a patient tell me that I am "old fashioned and behind the times, indeed," if I consider putting a thin wool (and silk) shirt on a 9 month old baby. She states that no wool is to be used for children nowadays. I have neither read nor heard anything about this recently, and I felt unable to refute the statement. If it is true, I should like to know by whom and how such a conclusion was reached. What would be the harmful effects of the use of wool for babies or older children when they are kept in poorly heated rooms such as are so often found in the average home here? As long as the sun shines no clothing seems needed, but with the rainy season and the foggy, damp night and morning hours, I shall have to be convinced, and my mind is open to conviction.

Laura C. Killen, R.N., Rancho Santa Fe, Calif.

ANSWER.—The clothing of children varies according to the age of the child and the temperature of his surroundings. The underwear may contain a small amount of wool. Generally speaking, in larger towns and cities the houses are sufficiently heated (around 70 F.) in cold weather so that an infant remains comfortably warm indoors without wool in his underclothing. In fact, the infant is often too warm when his underclothing contains wool.

When he goes outdoors, sufficiently heavy overclothing should be worn to meet the temperature. However, for infants living in poorly heated rooms during the rainy season, as described by the inquirer, especially if the room temperature is below 65 F. during the day, some wool in the underclothing would be desirable.

The chief harmful effect of wool is that it occasionally irritates an infant's skin (producing itching and dermatitis). Some infants are allergic to it. Woolen clothing does not withstand boiling as well, and it may be too warm when the house warms up.

ULTRAVIOLET RAYS AND POLIOMYELITIS VIRUS

To the Editor:—A few cases of sporadic poliomyelitis have appeared in the neighborhood. A recent symposium on this subject in *The Journal* stated that oxidizing agents and ultraviolet rays kill the poliomyelitis virus. Would it be feasible to institute gargles of hydrogen peroxide or potassium permanganate for children (a) as palatable preparations and (b) given daily, without injury to the mucosa? Can ultraviolet rays be applied directly to the oral mucosa, say, daily, without injuring it? If so, what is the dose and how long should it be administered?

Henry Rosner, M.D., Brooklyn.

ANSWER.—Oxidizing agents and ultraviolet rays will kill poliomyelitis virus in vitro, but it is highly improbable that such agents could be made to approximate the virus in vivo. It would be useless to give such agents if the virus had entered the human system and had been absorbed via nerves at some point along the gastrointestinal tract between the mouth and the duodenum, and it would be impracticable to treat any one before that time. During epidemics it is conceivable that such agents might be tried in prophylaxis, but at best the effects would be fleeting. Should the virus be swallowed in the interim between applications, the disease might still result. Potassium chlorate, also an oxidizing agent, has been used in this disease, but experimental and clinical studies have demonstrated its uselessness. Ultraviolet rays will kill the virus of poliomyelitis if they strike directly a thin layer of virus suspension, but theoretically they will not penetrate the mucosa deeply enough, nor could they be applied long enough, to kill all the virus that might be present. Human beings cannot be continuously exposed, and since ultraviolet rays can be given only at intervals the virus could be swallowed between therapeutic exposures and the direct beneficial effects of the rays would be questionable.

PREPARATION OF SULFATHIAZOLE FOR APPLICATION TO EYE

To the Editor:—I have been engaged in the practice of the diseases of the eye, ear, nose and throat for fifty-one years and have had a limited experience with chronic lid trouble of various forms. I thought I would try sulfathiazole for this condition but I have not been able to make a solution, as the most of the drug will not dissolve in water. Can you give me any suggestions about the use of this drug in chronic lid troubles and how I can get a perfect solution of this drug that can be used in the eyes without pain or irritation?

Milton T. Jay, M.D., Portland, Ind.

ANSWER.—Successful treatment of any superficial infection by the local application of sulfathiazole (or of other sulfanilamide derivatives which are active in vitro) is dependent on the maintenance of an adequate concentration of the drug at the site of the infection. Since the effect of these drugs is primarily bacteriostatic rather than bactericidal, an adequate concentration must be maintained constantly and for a considerable period

before the infection is eradicated. This is better accomplished in or about the eye by using sulfathiazole in ointment form rather than in liquid solution, because the latter is quickly diluted and carried away by the tears.

The clinical value of using sulfanilamide derivatives locally for various ocular infections has not been clearly established. Sulfanilamide and sulfathiazole ointments appear to be of value in the treatment of infected corneal ulcers and probably of certain types of superficial conjunctivitis, but this form of therapy is probably of little or no value in deeper infections (Guyton, J. S.: Local Use of Sulfanilamide Compounds in the Eye, *Am. J. Ophth.* 24:292 [March] 1941). Little beneficial effect can be expected in marginal blepharitis, because the drug cannot easily reach the depths of the infected sebaceous and sweat glands.

Sulfathiazole is soluble in water or in physiologic solution of sodium chloride only to approximately 0.1 per cent at 37 C. A 5 per cent solution of sulfathiazole which is only slightly irritating to the eye can be obtained by dissolving the drug in a 10 per cent aqueous solution of triethynolamine. A 5 per cent ointment which is almost nonirritating to the eye can be prepared by mixing exceptionally fine sulfathiazole powder in a petrolatum-hydrous wool fat base. An even smoother and less irritating ointment can be prepared by dissolving the sulfathiazole in a small amount of triethynolamine before mixing it with the ointment base.

GLASSES FOR TESTING NIGHT BLINDNESS

To the Editor:—Is there on the market any reliable device—such as lenses of graded degrees of darkness—which could be used in testing vision by the Snellen chart or similar charts to reveal night blindness? I am not asking about more complicated testing apparatus, such as is used in refractions and other thorough eye examinations, but rather about a simple pair of glasses that might do in the tests of visual acuity, such as a nurse might give, and would indicate the need of a more adequate examination by an eye specialist.

Theodore M. Frank, M.D., Texas City, Texas.

ANSWER.—The series of Tscherning's photometric glasses made in Copenhagen is designed for this purpose. These have a light-proof velvet case and cells in which glasses of an absorption varying in logarithmic degrees are placed. After wearing the no. 8 glasses for ten minutes a normal person can see the bars of a window through them, while a person with night blindness will be unable to do so. Glasses of another number are such that the 20/200 letter of Snellen's chart can be read through them by the normal person after ten minutes' adaptation. Such tests are rather crude and would probably screen out only cases of rather severe night blindness. It is doubted that tests with these glasses would reveal night blindness of mild degree. As far as is known, similar graded lenses are not made in America, but a series of tests on the Snellen chart with ordinary welder's goggles padded carefully to exclude light might establish standards which would be useful. A period of at least ten minutes for adaptation with the glasses on would be advisable.

AMINOPHYLLINE AND MENTAL DISTURBANCE

To the Editor:—For two months I have been treating a man of more than 70 who has been suffering from bronchial asthma for decades. All kinds of treatments have been unsuccessful. The only relief in his heavy attacks is accomplished by (besides occasionally necessary narcotics) intravenous injections of 0.48 Gm. of aminophylline in 20 cc. of physiologic solution of sodium chloride. Is there any danger that these daily injections may lead to other, especially mental, disturbances? His wife told me that recently he often talks incoherently and to himself.

Oskar Ury, M.D., San Francisco.

ANSWER.—There is practically no danger that daily injections of aminophylline will lead to mental disturbance or any other injurious effects. The patient's incoherence may be due to vascular changes due to cerebral arteriosclerosis. Since aminophylline is a vasodilator, it is possible that without the use of this drug symptoms of mental disturbance would be even more severe. Since the dose of aminophylline employed by the inquirer is twice the usual dose, it is suggested that a reduction in the dose may produce equally efficient results.

TYPHOID VACCINE AND SULFANILAMIDE-FAST GONORRHEA

To the Editor:—Is there any rationale to the intramuscular use of a mixed typhoid vaccine in cases of sulfanilamide-resistant, uncomplicated acute or chronic gonorrheal urethritis?

M.D., Tennessee.

ANSWER.—A careful search through the recent literature fails to reveal anything concerning the use of typhoid vaccine in the treatment of gonorrhea as far as sulfanilamide-fast gonorrhea is concerned.

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THE PHYSIOLOGIC BASIS OF THE NEUROGENIC BLADDER

JOSEPH P. EVANS, M.D.

CINCINNATI

The propriety of presenting yet another paper dealing with the physiology of micturition might well be questioned since the literature on the subject has become so voluminous as to be repetitious. The presentation of significant new data or the pointing out of new problems would be adequate justification. In this instance, however, I shall attempt so to strip the subject of its physiologic and neurologic complexities as to provide a useful working concept of bladder activity which the practitioner can utilize in handling his everyday problems. The authoritative work of Denny-Brown and Robertson¹ and of Langworthy, Kolb and Lewis² may be referred to for detailed presentation and analysis of the experimental and clinical evidence.

There are several basic anatomic and physiologic facts that are a prerequisite to an understanding of the problem. Briefly they are as follows: The bladder is made up of smooth or involuntary musculature. The detrusor muscle, which expels fluid from the bladder, merges insensibly into the musculature of the bladder neck, which forms the internal sphincter. The two muscles—detrusor and sphincter—receive their nerve supply by way of the pelvic nerves, derived from the second and third sacral segments, and their common nerve supply is reflected by the fact that they act in unison, the sphincter relaxing as the detrusor contracts, and vice versa.

Such coordinated activity makes implicit a neural organization. Sensory data on the state of muscle stretch must be carried to the central nervous system, and motor activity must be initiated over the motor pathways. A graphic concept of such activity³ may easily be obtained by a study of the passage of the nerve impulse upward toward the central nervous system from the musculature of the bladder. One may sample in the experimental animal the nervous activity in the sensory fiber by leading its cut end across electrodes connected with the input of an amplifying system which "boosts" the strength of the action current sufficiently that it activates a recording oscillograph (fig. 1). Resting activity shows a rather low rate of discharge over

the nerve fiber, but when the bladder wall is stretched by the addition of fluid the muscle bundles supplied by the nerve fiber in question become stretched, and the stretch is signaled to the central nervous system by an increased rate of discharge up the nerve fiber (fig. 2). Testing the motor fiber in a similar fashion (fig. 5), one finds that the activity therein changes from one that keeps the muscle of the bladder wall at a level of moderate tension to one which resists the addition of an increment of fluid or which takes part in a concerted effort actually to expel all fluid and thereby to evacuate the bladder. A simultaneous increase in the discharge to the internal sphincter apparently inhibits an inherent tone in the internal sphincter and results in its relaxation if the detrusor contraction is a powerful one (fig. 6).

The sensory fibers bear to the sacral cord segments the impulses indicating the state of stretch of the detrusor and sphincter musculature; the motor fibers bear to the bladder and its neck—that is the internal sphincter—the impulses dictating the motor response. These simple anatomic facts are depicted in figure 4. It should be borne in mind that cells of the anterior horn which give rise to the motor fibers belong to the autonomic or parasympathetic system, as would be expected, since they are destined to supply involuntary muscle.

The problem is simplified if one realizes that the bladder is able to function effectively without participation of the external sphincter. The latter structure serves an auxiliary purpose; it is made up of striated or "voluntary" muscle and its central motor connections also lie in the second and third sacral segments, but the cells of the anterior horn lie in that portion of the gray matter which has to do with the somatic—as opposed to the parasympathetic—system, thus making these centers subject to a greater degree to the control of the will.

The external sphincter is at most times kept in a constant state of "tone" or closure by a steady stream of nerve impulses transmitted from these centers downward to the sphincter by way of the pudendal nerves. Relaxation of the sphincter occurs only when these impulses cease to arrive at the muscle; at such times urine can pass by the sphincter, the passage being abruptly cut off when a resumption of the nervous discharge occurs. The activity over the pudendal nerve is well represented in figure 3. Relaxation of the sphincter, accomplished by interruption of the nervous discharge, can be brought about only by a reflex dependent on contraction of the bladder detrusor, but closure of the sphincter—accomplished by a resumption of the nervous discharge—is under direct control of the will (fig. 8).

It is now well recognized that the nervous control of the bladder is not centered in a particular part of the central nervous system; rather supervisory centers are

From the Department of Surgery and the Laboratory of Neuropathology, University of Cincinnati College of Medicine.

Read before the Section on Urology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Denny-Brown, D., and Robertson, E. G.: On the Physiology of Micturition, *Brain*, 56: 149 (July) 1933; The State of the Bladder and Its Sphincters in Complete Transverse Lesions of the Spinal Cord and Cauda Equina, *ibid.*, 56: 397 (Dec.) 1933.

2. Langworthy, O. R.; Kolb, L. C., and Lewis, L. G.: Physiology of Micturition, Baltimore, Williams & Wilkins Company, 1940.

3. Evans, J. P.: Observations on the Nerves of Supply to the Bladder and Urethra of the Cat, with a Study of Their Action Potentials, *J. Physiol.*, 56: 396 (May 4) 1936.

located at several points. An analogy might be made to the airfighter squadrons of present day warfare, except that the neurologist refers to "levels" of control. The isolated bladder musculature, whose fibers are unable to act in concert, may be likened to the individual air-dromes deprived of all but the most primitive means of communication. The sacral levels whose function it is to coordinate the activity of the bladder musculature by sensory and motor impulses may be compared to the aerial sector control center, to which information filters

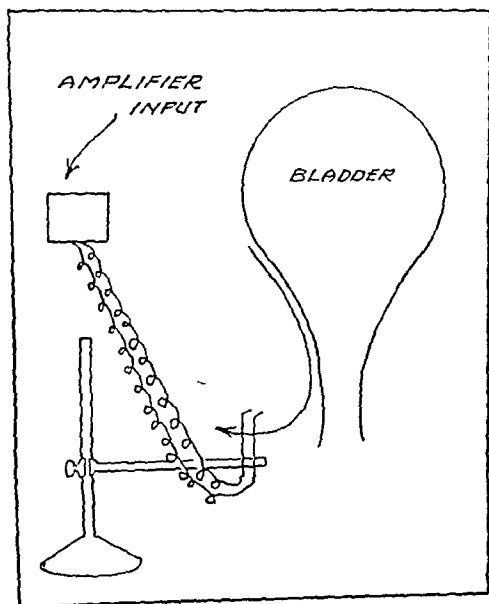


Fig. 1.—Arrangement of dissection to test sensory activity in the nerve supply of the bladder.

and from which commands are forwarded. The mid-brain levels which secure a more complete bladder function and aid in coordination with other bodily activities may be likened to the group control station, and the cerebral centers obviously are comparable to fighter command headquarters.

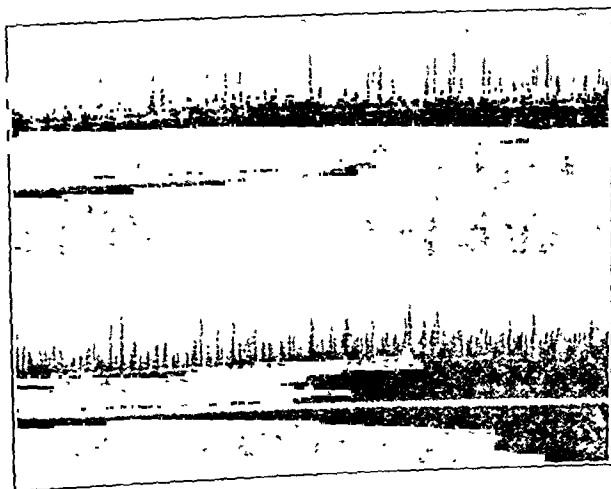


Fig. 2.—Oscillographic record of increased sensory discharge occurring when sudden distention of the bladder is artificially produced.

The lowest level of bladder activity is, then, the bladder which is isolated from its central nervous system connections. This is the type of activity which one may expect when the bladder is separated from the sacral levels of the cord, as in a complete lesion of the

cauda equina, or when there is interruption of the posterior (sensory) root fibers, as in tabes dorsalis, or when there is actual destruction of the conus medullaris—the terminal portion of the spinal cord containing

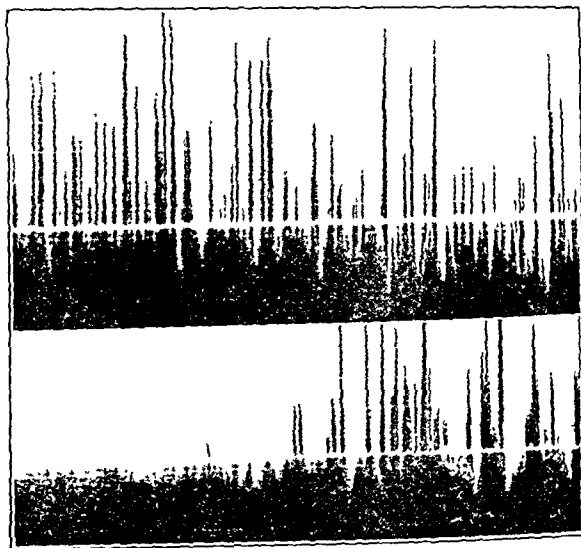


Fig. 3.—Upper record shows continuous discharge over pudendal nerve which keeps the external sphincter shut. Lower record shows discharge in abeyance, then sudden resumption of activity coincident with contraction of external sphincter.

the sacral segments (fig. 8). In these instances the innervation of the external sphincter is lost, and since the sphincter is then toneless, as are the other skeletal muscles supplied by the same segments, it no longer

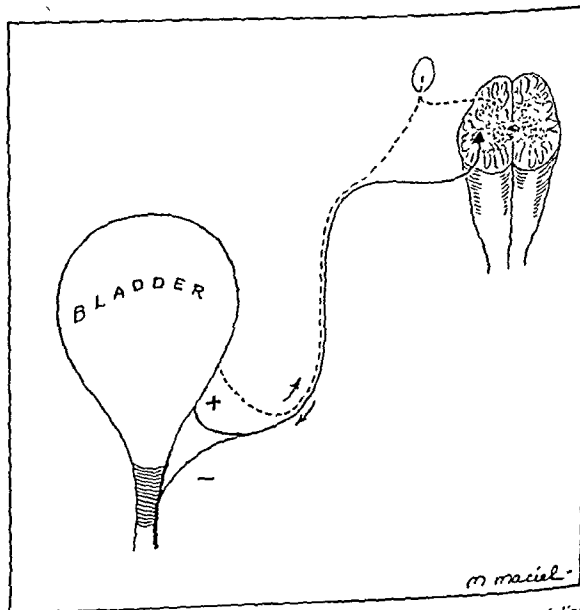


Fig. 4.—Relationship of sacral segments to the bladder. Dotted line represents sensory pathway and posterior root ganglion and solid line represents motor pathway. Plus sign indicates positive effect producing contraction of detrusor. Minus sign indicates negative effect resulting in relaxation of sphincter.

functions and offers no resistance to the passage of urine. Neural organization is therefore limited to the pelvic and intramural plexuses, which contain, in a fashion characteristic of the autonomic nervous system, ganglionic clusters possessed of independent activity. Under these circumstances one can expect only a relatively incompetent coordination of bladder muscle

activity, devoid of effective integration—the isolated airdromes of our analogy.

One may now concern oneself with the next higher level of neurologic function—that which involves reflex activity through the sacral cord. It is at this level that one first deals with spinal reflexes. Through the mediation of the cord segments sensory impulses are coordinated and motor activity is regulated. Thus a spinal transection above the sacral level gives rise to what has been termed the spinal cord bladder. If the severance

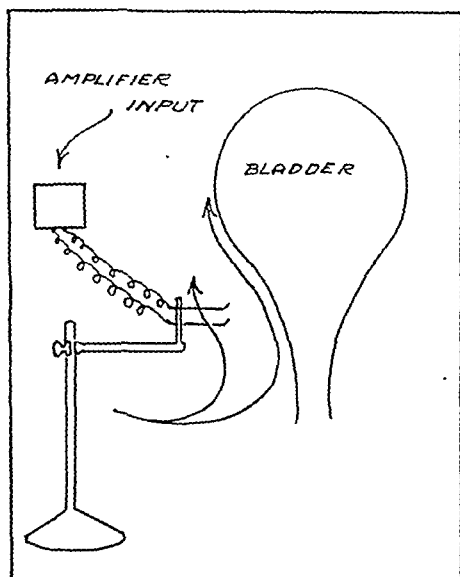


Fig. 5.—Arrangement of dissection to test motor activity in the nerve supply of the bladder.

is sudden, there occurs a period of "spinal shock" when all nervous activity below the lesion is in abeyance. Under these circumstances the external sphincter is thrown out of function, the detrusor does not contract and no urine is forced past the bladder neck, which either possesses an inherent tone despite the presence of neural shock or, as believed by some authors, offers a moderate mechanical obstruction to the fluid in the absence of detrusor contraction. The bladder distends inertly until the pressure within the distended relaxed viscus rises sufficiently to force fluid past the mildly resisting internal sphincter.

With the recovery from spinal shock, however, there begins to occur the passage of sensory and motor nerve impulses over the neural pathways. These awake the musculature to activity and waves of contraction occur in the bladder wall. With the onset of a strong contraction of the bladder the internal sphincter relaxes, as does the external sphincter in turn, and urination results. As is true of skeletal muscles in lesions of the transverse cord, there develops a "contracture" of the involuntary muscle of the bladder so that in time the bladder becomes of smaller size, and the reduced capacity results, of course, in more frequent voiding. Furthermore, because the cord bladder falls short of complete neural organization, the emptying is not completely efficient and there is often a residual amount of urine. Such a bladder is of course devoid of all conscious representation, so that its activity is carried out on a purely spinal reflex level, without sensory or motor control from the

supraspinal levels of neurologic activity. The bladder situation in this analogy is like that of fighter units under the command of the sector control station, better integrated but only partially efficient.

Extensive studies in lower animals have shown that there are centers in the midbrain which exert an influence over micturition, and when connections with midbrain levels are maintained the micturition mechanism, though still carried out at subconscious levels, is more smoothly coordinated and voiding is done efficiently. In analogy a group control station is now in command and the situation can be dealt with more effectively.

Finally, there are "centers," located in the paracentral lobule (fig. 7), which represent the highest levels of

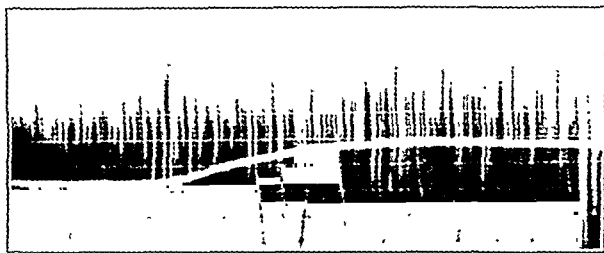


Fig. 6.—Oscillographic record of increased motor discharge occurring when sudden distention of the bladder is artificially produced.

neural organization for micturition. Destructive or irritative lesions in these regions result in retention or incontinence, and frequently urinary disturbances in persons with cerebral lesions represent difficulties due not to mental disturbance but to direct involvement of nervous control of bladder activity. In analogy, there is here represented the fighter command headquarters.

No reference has been made up to this point of the role of the sympathetic nervous system. There is evidence, sometimes equivocal, that in certain abnormal states section of the presacral nerves, which send fibers to the urinary bladder, facilitates micturition. But the old concept of the parasympathetic system as being the expellant mechanism, opposed by a "holding" mechanism innervated by the sympathetic system, is no longer generally held. It is probably better to recognize the

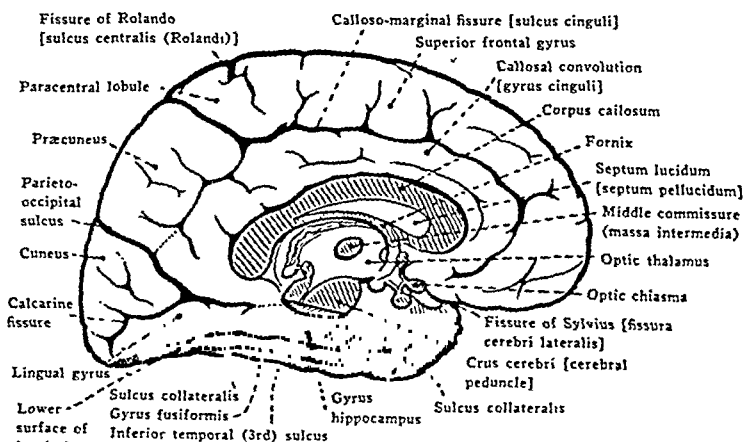


Fig. 7.—Mesial aspect of hemisphere, showing paracentral lobule. (From Pauchet and Dupret: Pocket Atlas of Anatomy.)

sympathetic supply to the bladder as dealing with activity of the trigon and of the ureter, with vasomotor control and with sexual function (ejaculation). This

rather arbitrary elimination of the sympathetic nervous system from a role in micturition is probably justifiable pending the production of more convincing evidence of its importance, and for the practical purposes at hand it simplifies consideration greatly.

In recapitulation one may descend the various levels of function. Beginning at the highest level one has the fully integrated mechanism of micturition subject to inhibition by the person who can suppress the desire to void for variable periods of time or who can initiate micturition at will. In passing, it would be well to mention that McGraw⁴ points out in a paper on maturation of neural activity in the child that bladder control may be gained for a time and then be lost as other neural mechanisms develop and demand attention and displace the dominance recently gained. Such fluctuation in control may go on for some time. The matter is of practical importance for it suggests a physiologic basis for the sometimes distressing periods of enuresis through which children pass. She suggests that in the normal child control will develop when the neural organization reaches a sufficiently well developed level and that there is little that can be done to hasten this organization.

At the next lower level of function, which may roughly be termed the midbrain level, micturition occurs subconsciously and without the exercise of the will but may still be very well coordinated.

At the spinal level, following the recovery from shock, a fairly well coordinated activity develops in time. The tone of the muscle is increased in typical cases, the capacity of the bladder is smaller than normal and the emptying is generally not complete. Such bladders are influenced by cutaneous stimuli reaching the central nervous system in the isolated segment, and they affect

Then there is the isolated or autonomous bladder that displays an ill coordinated activity which is devoid of spinal reflex implications because of being isolated from the spinal cord.

There are certain practical considerations which I should like to stress:

1. The bladder musculature should never be allowed to stretch unduly. To do so means stretched muscle fibers, which like those of skeletal muscle are then less well able to respond to nervous activity.

2. A stretched bladder wall is more prone to infection. Infection followed by fibrosis leads to impairment of bladder function and interferes with the resumption of motor activity when nervous control is restored.

3. The bladder musculature is subject to and can be benefited by passive exercise just as in the case of skeletal muscle. Such passive exercise is accomplished by the employment of tidal drainage as long used by Hinman and as popularized by the work of Munro.⁵ Tidal drainage is sound bladder physiology.

BLADDER DIFFICULTIES OF TABETIC PATIENTS

WITH SPECIAL REFERENCE TO TREATMENT BY
TRANSURETHRAL RESECTION

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AND

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In previous articles one of us¹ has emphasized that in most cases of vesical atony it is extremely difficult and often impossible to state with accuracy whether the vesical dysfunction is a result of primary neurogenic atony, neurogenic atony complicated by obstruction of the vesical neck or myogenic atony secondary to obstruction of the vesical neck. By means of illustrative cases in these previous papers it was shown that even though the most careful cystoscopic, cystometric and neurologic examinations are performed they often fail entirely to supply the correct answer to this diagnostic problem. It was brought out also that the etiologic differentiation of these conditions may be relatively unimportant as far as treatment is concerned.

This subject assumes considerable importance when patients who are suffering from tabes dorsalis are concerned. The classic description of the pathologic changes found in this disease are "chronic inflammation of the posterior spinal ganglia, posterior nerve roots between the ganglia and the spinal cord and to some extent the meninges, degeneration of the columns of Goll and Burdach, primary atrophy of the optic nerve and interruption of the pathway which has to do with the ciliary reflex."² The vesical symptoms initiated by tabes dorsalis are, therefore, those that result from damage to the sensory roots of the sacral nerves which form the sensory component of the reflex arc that serves for micturition.

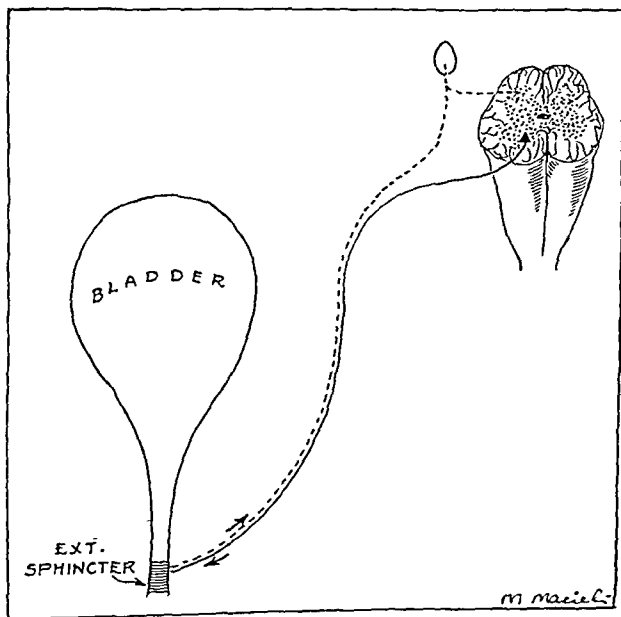


Fig. 8.—Relationship of sacral segments to the external sphincter. Dotted line represents the sensory pathway and solid line the motor pathway.

the local reflex arc. This fact explains the emptying of the bladder that may be brought about by penile manipulation preceding catheterization, and likewise the inhibition of micturition by cutaneous stimuli derived from areas less directly related to the micturition arc.

4. McGraw, Myrtle B.: Neural Maturation as Exemplified in Achievement of Bladder Control. *J. Pediat.* 16:580 (May) 1940.

5. Munro, Donald: The Cord Bladder: Its Definition, Treatment and Prognosis When Associated with Spinal Cord Injury. *J. Urol.* 36:710 (Dec.) 1936.

From the Section on Urology, Mayo Clinic.

Read before the Section on Urology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Emmett, J. L.: "Tabetic Cord Bladder": Newer Concepts in Diagnosis and Treatment, *Proc. Staff Meet., Mayo Clin.* 15:91-96 (Feb. 7) 1940; Urinary Retention from Imbalance of Detrusor and Vesical Neck: Treatment by Transurethral Resection, *J. Urol.* 43:692-704 (May) 1940.

2. Wechsler, I. S.: *A Textbook of Clinical Neurology*, Philadelphia, W. B. Saunders Company, 1927, p. 117.

Attempts to present a logical anatomic and physiologic reason for the vesical symptoms found in this disease have resulted in various explanations based on theories as well as facts. It is our aim in this paper to avoid theoretical discussion and to confine ourselves to the statement of clinical observations which we feel should be helpful to the physician caring for these unfortunate patients. Nevertheless, in order to present the subject in an intelligible manner it will be necessary to comment briefly on the more common theories which are currently accepted.

Dees and Langworthy³ have shown experimentally that section of the posterior sacral roots in cats results in an enlargement of the lumen of the bladder accompanied by urinary retention and incontinence. They found that some of this vesical distention could be prevented by passively emptying the bladder by manual pressure or by drainage with an indwelling urethral catheter. Jacobson,⁴ working at the Mayo Clinic, has obtained the same results on dogs. The experimental lesions produced by these investigators simulate the clinical lesion of tabes dorsalis.

On reading articles on this subject, it is necessary to distinguish carefully between statements based on fact and statements based on theory. For instance, that the urinary bladder dilates and urinary retention and incontinence occur after interruption of the sensory part of the reflex arc are facts. The explanation as to why this reaction occurs is theory. One theory is that, because the reflex arc is interrupted, the stimulus to initiate micturition does not get through to the motor side of the reflex arc. Also there is no sensation of wanting to urinate and as a result of these factors the bladder becomes distended. The result of distention is a weakening of the muscle fibers of the detrusor and thus a vicious cycle is established. Some workers in the field⁵ suggest that in this condition the external sphincter may become hypertonic and act as an obstruction to the outflow of urine. Sufficient proof of this statement is not available. Also the subject of incontinence in this disease has elicited much speculation and some rather loose statements. In the literature have appeared such statements as "the incontinence is probably a true overflow incontinence in most cases." We must confess that we also shared this opinion until this study was undertaken. We now realize that, although this is true in some cases, many of these patients who are incontinent do not have any residual urine or have only small amounts.

It is only necessary to read the scanty literature on the subject of vesical disturbances in cases of tabes dorsalis to realize that the subject is still one of the mysteries of medicine. The "hands off" policy has been the physician's procedure of choice for these unfortunate patients, and as a group they have not been especially well cared for in the past. More facts and clinical data concerning this condition are needed if a satisfactory solution to this diagnostic and therapeutic problem is ever to be achieved. In an effort to contribute data to this subject, this study was undertaken.

MATERIAL

This study is based on a review of the records in 977 cases in which the diagnosis of tabes dorsalis was made at the Mayo Clinic during the seven year period

³ Dees, J. E., and Langworthy, O. R. An Experimental Study of Bladder Disturbances Analogous to Those of Tabes Dorsalis, *J. Urol* 31: 359-371 (Nov.) 1935.

⁴ Jacobson, C. Personal communication to the authors.

⁵ Rose, D. K., and Shefts, L. M.: Tabetic Bladder. Discussion of Etiology and Cystometric and Pathologic Studies, *South M J* 32: 546-549 (May) 1939. Dees and Langworthy.

1934 to 1940 inclusive. Two hundred and five (21 per cent) of the patients were females. Seven hundred and seventy-two (79 per cent) were males. The age of the patient at the time the diagnosis of tabes was first made at the clinic forms the basis of an interesting grouping of the patients (table 1). It will be noticed

TABLE 1.—Age Grouping of 977 Patients Who Had Tabes Dorsalis

Age, Years	Patients	Per Cent
10-19..	2	0.2
20-29..	12	1.2
30-39..	175	17.9
40-49..	365	37.5
50-59..	305	31.2
60-69..	105	10.7
70-79..	13	1.3
Total	977	100

that the majority of patients, 670 (69 per cent), were in the age groups from 40 to 59 years. Of the 977 patients afflicted with tabes dorsalis, 419 (42.8 per cent) complained of symptoms referable to the urinary bladder. It is of interest to note that these figures agree fairly closely with the incidence of urinary symptoms in cases of tabes given by Langworthy, Dees and Lewis⁶ in their study of 278 cases of tabes dorsalis. The relative incidence of vesical symptoms of male and female patients is of interest. Of the 205 female tabetic patients, 74 (36 per cent) suffered from symptoms referable to the bladder, whereas 345 (44.7 per cent) of the 772 male tabetic patients complained of vesical symptoms. The remainder of this study will be confined to the 419 cases in which vesical symptoms were present.

ANALYSIS OF DATA ON 419 CASES OF TABES DORSALIS AND URINARY DYSFUNCTION

Vesical Symptoms.—Vesical symptoms are found most commonly among tabetic patients who are from 40 to 59 years of age (table 2). This is of course the age group in which urinary symptoms of obstruction of the vesical neck occur most often among men who do not have tabes dorsalis.

In considering the type of symptoms encountered in these cases, a word of explanation is in order. In many

TABLE 2.—Age by Decades of 419 Patients Who Had Tabes Dorsalis and Symptoms Referable to the Urinary Bladder

Age, Years	Males		Females	
	Number	Per Cent	Number	Per Cent
10-19	..	..	1	1.4
20-29	..	..	2	2.7
30-39	51	14.9	12	16.2
40-49	118	34.2	33	44.5
50-59	107	31.0	21	28.4
60-69	28	16.8	5	6.8
70-79	9	2.6	..	..
Total	345	100	74	100

of these cases the vesical symptoms were of course purely coincidental and were in no way connected with the tabetic condition. As we mentioned previously and shall attempt to demonstrate subsequently, we feel that it is impossible to state with any degree of accuracy just what part the tabetic lesion plays in the vesical dysfunction in any given case. For this reason we have listed all urinary symptoms complained of by these patients. The incidence of the various urinary symp-

⁶ Langworthy, O. R., and Dees, J. E.: The Urinary Bladder in Tabes Dorsalis. *Ann. Surg.* 60: 364-381 (July) 1936.

toms in the 419 cases is given in table 3. It will be observed that the most common symptoms were incontinence, hesitancy, poor stream, nocturia, terminal dribbling, infrequent desire to void and inability of the patient to tell when the bladder was full. As far as the male was concerned, aside from the incontinence and inability to tell when the bladder was full, the symptoms

TABLE 3.—Type of Symptoms Referable to the Urinary Bladder of 419 Patients Who Had Tabes Dorsalis

Type of Symptom	Incidence	
	Among 345 Males	Among 74 Females
Incontinence of any type or degree including nocturnal incontinence	150	37
Nocturnal incontinence only	56	3
Urgency...	16	9
Inability to know when bladder is full or infrequent desire to void	48	5
Hesitancy	157	12
Poor stream	120	8
Interrupted stream	9	0
Terminal dribbling	56	0
Episodes of acute retention	12	1
Frequency	28	14
Nocturia	89	22

were those common to the condition of uncomplicated obstruction of the vesical neck.

Residual Urine.—The entire group of 419 cases were considered from the standpoint of the amount of residual urine present. We regret that our data on this subject are so incomplete. It will be noticed from table 4 that for 45.2 per cent of the male patients and 71.6 per cent of the female patients no determination of residual urine was made. This high percentage is due to the fact that the clinician in the clinic and to a less extent those of us in the urologic section for years have followed the old dictum that instrumentation in such cases should be avoided when possible. From this table it will be noticed that residual urine is much more common among men than among women. It will be noticed also that only 77 male patients were found to have more than 150 cc. of residual urine, and yet 150 male patients (table 3) complained of some form of incontinence. These figures suggest that though a generous portion of the incontinence in this

TABLE 4.—Amount of Residual Urine Among 419 Tabetic Patients Who Had Symptoms Referable to the Urinary Bladder

Amount of Residual Urine	Males		Females	
	Number	Per Cent	Number	Per Cent
Complete retention	2	0.6	2	2.7
More than 150 cc of residual urine	75	21.7	7	9.5
Less than 150 cc of residual urine	63	18.3	8	10.8
No residual urine	49	14.2	4	5.4
Patient not catheterized	156	45.2	53	71.6
Total	345	100	74	100

condition could be an overflow type of incontinence certainly not more than 50 per cent could be attributed to this cause.

Incontinence.—The subject of incontinence is interesting and important. Probably no medical term is used more inaccurately. It is used inaccurately to describe cases of urgency or precipitate urination, to describe the constant dribbling of an overflowing bladder (paradoxical incontinence), to describe the occasional involuntary urination during sleep, and so on.

In short, the word "incontinence" is used to describe so many conditions that an explanation should accompany it each time it is used. In this study it has not been an easy matter in some cases to classify accurately the type of incontinence owing to lack of determination of residual urine or inadequate description of the condition in the patient's history. However, a reasonably accurate classification of the types of incontinence found in these cases has been made in table 5. As mentioned before, 150 males and 37 females complained of incontinence. The most common type of incontinence encountered was a very mild type; this usually was described by the patient as "I occasionally lose a few drops of urine before I am aware of it" or "if I forget to empty my bladder at fairly regular intervals I may lose a little urine." Next in frequency of occurrence was continuous leakage. From table 5 it may be seen that, in more than half of the cases of this type of incontinence in which the amount of residual urine was determined, 150 cc. or more was present. This

TABLE 5.—Type of Incontinence and Its Relation to Amount of Residual Urine Present Among 187 Tabetic Patients Who Complained of Urinary Incontinence

Type of Incontinence	Males					Females				
	Total	Residual Urine, Cc				Total	Residual Urine, Cc			
		150 or More	Less Than 150	None	Not Determined		150 or More	Less Than 150	None	Not Determined
Marked incontinence (including so called overflow incontinence)	42	23	5	3	11	13	3	2	2	6
Very mild and occasional incontinence (occasional loss of a few drops of urine)	57	12	17	2	26	14	0	0	0	14
Incontinence only with straining or coughing	2	0	0	0	2	4	0	0	0	4
Urgency to point of incontinence	6	1	0	0	5	4	0	1	0	3
Incontinence only when bladder was allowed to become too full before voiding	5	2	1	0	2	2	0	1	1	0
Nocturnal incontinence only	38	9	4	4	21	0	0	0	0	0
Total	150	47	27	9	67	37	3	4	3	27

indicates that a generous proportion of these patients was probably suffering from a true overflow type of incontinence. Nevertheless, attention must also be called to the fact (table 5) that several of the patients who had pronounced incontinence had little or no residual urine. The probable reasons for the various types of incontinence will be considered subsequently.

Cystoscopic Data.—In most of the older textbooks of urology the "cord bladder" of tabes is described as one in which cystoscopic examination discloses some or all of the following: (1) reduction in expulsive force of the bladder, (2) reduction in sensation (as determined by how much pain the patient experiences during the time the cystoscope is manipulated), (3) relaxation of the vesical neck (as determined by observation only) and (4) trabeculation of the bladder. The trabeculation is described as being of fine caliber in contrast to the coarse trabeculation seen in the presence of urinary retention caused by obstruction of the vesical neck. All physicians who have had considerable cystoscopic experience will agree that all of these conditions are seen in only the minority of such cases, whereas

in most cases only a few are present. When the latter situation is present, it has resulted in a diagnosis such as "atypical cord bladder."

In studying these 419 tabetic patients who had symptoms referable to the urinary bladder, we were disappointed to find that only 129 had been subjected to cystoscopic examination. The reason for this low incidence of cystoscopic examination is of course the old, ever present, fear of the danger of instrumentation to tabetic patients who have "cord bladders." Unfortunately, the data in these cases in which cystoscopic examination was done were not always given in complete form. For this reason we are unable to present definite percentages for the incidence of the so-called typical findings associated with cord bladder. To make the best of the information available, table 6 is presented. It indicates the number of times reduction in sensation and expulsive force, relaxation of the vesical neck, trabeculation of the bladder and obstruction of the vesical neck were indicated on the records of the cystoscopic examination. One of the most interesting revelations in this table is that the size of the trabeculae in the bladders varied greatly. It will be noticed that the sizes of the trabeculae have been graded from 1 to 4.

TABLE 6.—Data Concerning 129 Tabetic Patients Who Were Subjected to Cystoscopic Examination

Observations on Cystoscopic Examination	Incidence		Total
	Among 111 Males	Among 18 Females	
Size of trabeculae			
Grade 1	26	3	29
Grade 2	19	3	22
Grade 3	21	1	22
Grade 4	6	1	7
Expulsive force reduced	47	5	52
Reduction of sensation	34	7	61
Relaxation of vesical neck	50	12	62
Obstruction of vesical neck			
Lobar hypertrophy of prostate	49	0	49
Bars, contracture of vesical neck or carcinoma	10	0	10
Combination of two types	2	0	2
Total	61	0	61

This suggests that the old dictum that fine trabeculae indicate a neurogenic bladder whereas coarse trabeculae indicate obstruction of the vesical neck may be seriously questioned. This table also shows that definite obstruction of the vesical neck was reported in 61 (55 per cent) of the male patients who were subjected to cystoscopic examination. The obstruction in 49 of these 61 cases was caused by definite lobar hypertrophy, in 10 by bars, contractures of the vesical neck or carcinoma and in 2 by various combinations of the two preceding groups.

We were interested to know whether cystoscopic examination in the cases of incontinence would yield information which might help to clarify the situation. We found that cystoscopic examination had been performed in 48 cases in which incontinence had occurred. The cystoscopic findings are given in table 7. There seems to be no significant difference in data from those obtained in the entire group of 129 cases (table 6) except that the incidence of relaxation of the vesical neck in the incontinent group is somewhat higher.

Treatment by Antisymphilitic and Local Measures.—The question is often asked In what proportion of cases of tabes dorsalis will urinary symptoms improve as a result of antisymphilitic treatment? This question can be answered best by referring to the article on tabes

dorsalis published by the Cooperative Clinical Group,⁷ in which a study was made of 985 cases of tabes dorsalis, in all of which treatment with antisymphilitic measures was employed. The only urinary symptom listed in this article was incontinence. It was found that in 24 per cent of these treated patients the incontinence disappeared during treatment, while in an additional 36

TABLE 7.—Data from Cystoscopic Examination Concerning 48 Tabetic Patients Who Had Incontinence

Observations on Cystoscopic Examination	Incidence		Total
	Among 38 Males	Among 10 Females	
Size of trabeculae			
Grade 1	6	2	8
Grade 2	10	3	13
Grade 3	9	2	11
Grade 4	4	1	5
Reduction of sensation	24	4	28
Reduction of expulsive force	21	4	25
Relaxation of vesical neck	27	7	34
Obstruction of vesical neck			
Lobar hypertrophy of prostate	13	0	13
Bars, contracture of vesical neck or carcinoma	2	0	2
Combination of two types	1	0	1
Total	16	0	16

per cent the condition was improved. This suggests that the urinary symptoms may be expected to improve in a considerable number of cases of tabes dorsalis after antisymphilitic treatment is instituted. It follows, therefore, that in any questionable case antisymphilitic therapy should always be given a fair trial before more radical therapeutic measures are undertaken.

Treatment by Transurethral Resection of the Vesical Neck.—Of the 345 males who had tabes and vesical symptoms, 35 (approximately 10 per cent) were subjected to transurethral prostatic resection. In some of these cases, of course, the urinary retention resulted from a simple obstruction of the vesical neck and the tabes dorsalis was purely a coincidental finding which played no part in the pathologic condition. In the

TABLE 8.—Residual Urine Before Transurethral Resection in 35 Cases of Tabes Dorsalis

Amount of Residual Urine, Cc.	Cases	Per Cent
More than 500	7	20.0
100 to 500	18	51.4
Less than 100	10	28.6
Total	35	100

TABLE 9.—Age by Decades of Tabetic Patients Subjected to Transurethral Resection

Age, Years	Patients
30-39	2
40-49	6
50-59	11
60-69	12
70-79	4
Total	35

majority of cases, however, most urologists would have difficulty in deciding whether the vesical dysfunction was the result of primary neurogenic atony, obstruction of the vesical neck with secondary atony or a combination of the two. This is evidenced by the fact that in 19 of the 35 cases diagnoses such as "cord bladder," "probable cord bladder" or "cord bladder associated

7. O'Leary, P. A.; Cole, H. N.; Moore, J. E.; Stokes, J. H.; Wile, U. J.; Parran, Thomas; Vonderlehr, R. A., and U'silton, Lida J.: Cooperative Clinical Studies in the Treatment of Syphilis: Tabes Dorsalis, *Ven. Dis. Inform.* 19: 367-396 (Nov.) 1938.

with obstruction of the vesical neck" were suggested by either the clinician or urologic consultants who saw the patient. For the majority of these patients in years past operation on the vesical neck would have been rejected because of fear of making them incontinent or increasing an already existing incontinence. In most of these cases cystoscopic examination disclosed reduction in expulsive force, reduction in sensation or both. In several cases relaxation of the vesical neck was mentioned in spite of the fact that definite enlargement of the prostatic lobes also was present. Cystometrograms were made in only a few cases; these revealed definite atonicity of the bladder with decrease in intravesical pressure and a marked sensory shift to the right. As stated previously, we have been unable accurately to establish the etiologic factor in vesical atony by means of cystometry. Thirteen of these patients were incontinent. The incontinence of 6 of them was no doubt a true overflow, as 3 had more than 1,000 cc. of residual urine and the other 3 between 500 and 1,000 cc. Five of the remaining patients who were incontinent were found to have between 100 and 500 cc. of residual urine and 2 less than 100 cc.

TABLE 10—Weight and Microscopic Examination of Tissue Removed at Transurethral Resection in 35 Cases of *Tabes Dorsalis*

Weight of Tissue, Gm	Cases	Microscopic Examination of Tissue			
		Adeno-fibromatous Hyperplasia	Carcinoma	Smooth Muscle Inflammatory Tissue	Smooth Muscle and Combination of Types
0-3	8	3		2	1
4-5	5	5			
6-10	9	8			1
11-20	7	7			
21-50	5	4	1		
More than 50	1	1			
Total	35	28	1	2	2

The amount of residual urine found in the entire group of 35 cases is shown in table 8, and the age of the patients is given in table 9.

The amount of obstructive tissue present in the vesical neck in these cases was not great (table 10). It will be noticed that in approximately two thirds of the cases 10 Gm. of tissue or less was removed and 5 Gm. or less was removed in 37 per cent. This serves to emphasize the important point previously mentioned by Braasch and Thompson⁸ that minimal amounts of obstruction of the vesical neck in the presence of an atonic bladder may be responsible for a great amount of vesical disability. It follows, therefore, that the vesical neck must be examined very carefully in cases of this disease.

Results of Operation.—The results of operation in these 35 cases were gratifying. Residual urine was eliminated in almost all cases. Of the 13 patients who suffered from incontinence prior to operation, 11 were relieved completely of this distressing condition. The other 2 were considerably helped. None of the patients who were not incontinent before operation were made incontinent by the operation. We are convinced that there is no more danger of incontinence following transurethral resection in cases of *tabes dorsalis* than in other cases. The patients in whom one would be inclined to expect mediocre or poor results would be the 19 patients in whom it was felt that part if not all of the vesical dysfunction was due to the tabetic

condition. This, however, proved not to be the case. In 15 of these 19 cases, excellent results were obtained and in 4 definite improvement occurred. No patients were made worse by the operation.

In the subsequent follow-up of these patients it has been brought to our attention by O'Leary⁹ and his colleagues that the general condition of the patients shows striking improvement as evidenced by gain in weight, decrease of anemia and lassitude, and especially decrease in the frequency and severity of neuritic pains when the vesical dysfunction is corrected and the residual urine eliminated. This is no doubt owing to the fact that the urinary infection can be controlled more efficiently or eliminated entirely.

COMMENT

As far as the subject of incontinence is concerned, it seems to us that this condition in cases of *tabes dorsalis* is chiefly of two general types, (1) overflow from a distended bladder and (2) intermittent involuntary urination or the occasional loss of a small amount of urine before micturition takes place. This urine is lost apparently because there is so much sensory loss that the patient is not aware that micturition is about to begin. It seems analogous to the condition of enuresis that some patients have while sound asleep. As a matter of fact, many tabetic patients complain of only "incontinence" that occurs during sleep.

We have no clinical data that would tend to confirm the theory that increased tone of the external urethral sphincter of tabetic patients may contribute to the urinary retention and difficult micturition. All of the data obtained from this study point to the fact that fibrosis or contracture of the internal (vesical) sphincter or obstruction in this situation produced by the enlargement of the prostate gland is more likely to be responsible. If any obstruction is present, transurethral resection of the vesical neck will yield brilliant results in many cases. As far as we are aware, any local treatment of the external urethral sphincter has been of no benefit in any of these cases. Any tabetic patient who has difficulty in voiding, incontinence (especially of the overflow variety), residual urine and some demonstrable obstruction of the vesical neck has an excellent chance of relief of symptoms by complete transurethral resection.

Any degree of obstruction at the vesical neck of a tabetic patient, no matter how minute, may produce severe vesical disability, whereas the same amount of obstruction may not cause any disability among patients who do not have *tabes*. The reason for this is quite evident. The interruption of the reflex arc which carries the impulses that initiate micturition plus the inability of the patient properly to recognize the presence of vesical distention (the result of involvement of the sensory fibers of the sacral nerves) results in gradual vesical distention which terminates in various degrees of vesical atony. When the atony is extreme and the involvement of the sensory pathways well defined, the desire to void may never be regained by the patient even though all obstruction of the vesical neck is removed. Nevertheless, such a patient can be taught after resection to empty his bladder by abdominal and manual pressure at regular intervals, so that usually the bladder is completely emptied at each voiding. This makes it possible completely to eliminate the urinary infection by use of urinary antiseptics so that the patient is able to live a fairly comfortable life without incontinence or the necessity of routine catheterization.

⁸ Braasch, W. F., and Thompson, G. J. Treatment of the Atonic Bladder. Surg., Gynec. & Obst. 61: 379-384 (Sept.) 1935

⁹ O'Leary, P. A. Personal communication to the authors

THE SURGICAL TREATMENT OF THE
AUTONOMOUS NEUROGENIC
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The autonomous neurogenic bladder results from destructive lesions of the cauda equina or conus terminalis. The bladder is totally deprived of its essential innervation by the parasympathetic division of the autonomic nervous system. The detrusor becomes hypertonic, but, because of the destruction of the spinal reflex, all reflex contractions are abolished. Bladder sensation is lost and voluntary sphincteric control is destroyed (fig. 1).

Sharing in the hypertonicity of the detrusor are those circularly arranged fibers at the vesical neck described as the internal sphincter. The hypertonic internal sphincter acts as a definite obstruction, almost exactly analogous to having contracture of a vesical neck superimposed on the entire picture. As a result, urine does not escape from the bladder until the intravesical pressure exceeds the obstruction in the outlet. Since reflex activity of the bladder is lost, voiding is accomplished only by straining or by continuous overflow dribbling incontinence. As time elapses, the obstructive manifestations become more pronounced as the bladder decompensates and increasing amounts of residual urine remain in the bladder. Ultimately, almost complete decompensation of the detrusor may occur with severe damage to the upper urinary tract.

Since nothing can be done about restoring innervation of the bladder surgical treatment is aimed at removing the obstructive factor. If this can be accomplished the patient should carry relatively small amounts of residual urine. By periodic attempts to void with straining he may also avoid to some degree the unpleasant continuous or periodic dribbling, and, in addition, will be spared the sequelae of decompensation of the bladder and damage to the upper tract.

The earlier methods of managing the problem were by permanent suprapubic cystostomy or by intermittent self catheterization. Permanent cystostomy is unsatisfactory because the bladder rapidly becomes greatly contracted and has practically no capacity. Because of the dangers of infection, self catheterization or a permanent indwelling catheter are poorly tolerated.

More recently, surgical treatment has been directed at relieving the obstruction of the internal sphincter by more direct methods; namely, presacral neurectomy or transurethral sphincterotomy.

Presacral neurectomy was based on the premise that the internal sphincter was innervated by thoracolumbar supply carried through the intact presacral nerves and that it became hypertonic owing to imbalance caused by removal of the parasympathetic inhibition. There is really no conclusive evidence that the internal sphincter has any different innervation than the rest of the detrusor muscle, of which it is only a specialized portion. Furthermore, regardless of the innervation concerned,

prolonged hypertonicity of the internal sphincter may cause it to become permanently spastic. Our limited experience with presacral neurectomy in these cases has not been encouraging.

Transurethral sphincterotomy is a more logical procedure since the obstructive lesion resembles contracture of the vesical neck. The results have proved encouraging, especially when operation is performed before secondary atony of the bladder has supervened. It is of importance to have the resection complete, since the expulsive force of the bladder is already inefficient because reflex activity has been abolished. In the two representative cases presented, the first is an example of the result obtained before secondary atony of the bladder has occurred. In the second case, atony of the bladder had occurred but tonicity was restored after a period of drainage after cystostomy.

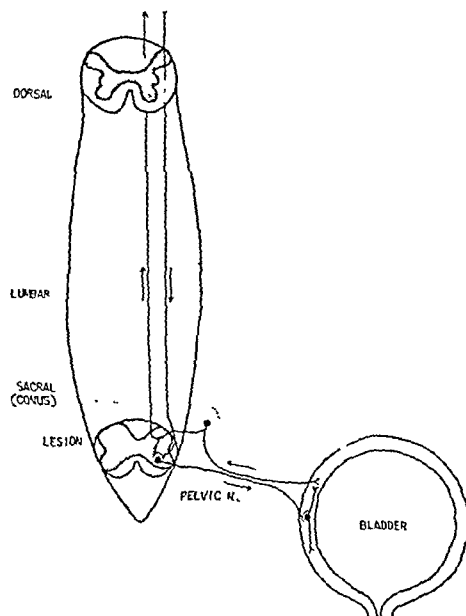


Fig. 1.—The autonomous neurogenic bladder is caused by any lesion which destroys the conus or cauda equina. The bladder is completely deprived of external innervation and depends entirely on its intrinsic myenteric plexus, whose fibers lie within the bladder wall. The bladder musculature and internal sphincter both are hypertonic. Despite the high intravesical pressure, the tonic sphincter acts as an obstruction. Since reflex activity is abolished, evacuation occurs only when the intravesical pressure exceeds the sphincteric obstruction. Voiding is by dribbling overflow. A high residual urine is present.

REPORT OF CASES

CASE 1.—E. H., a youth aged 18, admitted Nov. 8, 1940, complained chiefly of having to strain to urinate and intermittent dribbling of urine. His parents stated that intermittent dribbling had been present since birth to a moderate degree. The patient had always had to strain to void, which condition has been slowly increasing in the past three years. He had been seen in the University Hospital in May 1927 and the diagnosis of spina bifida, neurogenic bladder and urinary incontinence was established. There had been moderate increase of straining since that time.

The past and the family history were irrelevant.

A general examination was negative except for saddle anesthesia. The patient voided a poor stream with straining.

Laboratory studies gave negative results except for a definite bacillary urinary infection. The residual urine amounted to 520 cc.

Cystometric study revealed a typical autonomous neurogenic bladder. Panendoscopic examination revealed a hypertonic internal sphincter and heavy trabeculation of the bladder.

From the Department of Surgery, University of Michigan Medical School.

Read before the Section on Urology at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

On Jan. 27, 1941 transurethral sphincterotomy was performed, 3 Gm. of tissue being removed. Microscopic examination revealed this to be smooth muscle with only a few prostatic glands (fig. 2).

After the operation the patient voided easily without straining, and the dribbling incontinence was minimal if the patient emptied his bladder periodically. A check-up one month after the operation revealed no residual urine.

CASE 2.—A man aged 35, admitted Dec. 24, 1940, complained chiefly of straining and dribbling incontinence.

As long as he could remember he had strained to void and lately there was dribbling, overflow incontinence. The straining had increased sharply in the past year, and the urinary stream was merely a dribble. The patient could not tell when the bladder was full but had attempted to void periodically at the time dribbling began.

A soft swelling had been present over the lumbosacral region since birth. There had been continuously present a trophic ulcer of the right foot for six years.

The past and the family history were irrelevant.

On physical examination the pertinent conditions were a lumbosacral meningocele with a small draining sinus. Neurologic conditions were diagnostic of myelodysplasia of the lumbar and sacral cord.

Laboratory examinations revealed no abnormality.



Fig. 2 (case 1).—Section of tissue removed by transurethral resection. It consists almost entirely of smooth muscle with only occasional prostatic glands.

Cystometric examination revealed a bladder in which sensation and reflex activity were lost. There was no rise of intravesical pressure until more than 700 cc. of fluid had been introduced, at which time the pressure increased slowly to 15 mm. of mercury at 800 cc. The residual urine was 600 cc. Cystoscopic examination revealed a heavily trabeculated bladder. The internal sphincter was hypertonic and rigid.

The diagnosis made was decompensated autonomous neurogenic bladder with hypertonic internal sphincter producing obstruction.

On December 26 transurethral resection was carried out, 4 Gm. of smooth muscle being removed. The patient voided much more easily after the operation but continued to carry from 200 to 480 cc. of residual urine. After about two months the stream again became poor and extreme straining with almost total retention developed.

Cystometric examination on April 16, 1941 revealed almost total atony of the bladder. On April 18 a suprapubic cystotomy was done; following this the bladder rapidly recovered its tone, and on May 1 a further transurethral resection was carried out. Following this the patient has been voiding more easily, with residual urine averaging 90 cc.

COMMENT

We feel that it is important to recognize and differentiate the decompensated autonomous neurogenic bladder from the atonic bladder of *tabes dorsalis* and from

the decompensated bladder of advanced prostaticism. In the first instance, the pronounced trabeculation of the autonomous bladder, in conjunction with the hypertonic internal sphincter and characteristic neurologic conditions of destruction of the sacral cord, differentiate it from the atonic tabetic bladder. Differentiation of the decompensated autonomous bladder from the atonic bladder of advanced prostaticism is less easy, but the age of the patient, the history of onset and neurologic and cystoscopic examinations make the distinction readily possible.

SUMMARY AND CONCLUSIONS

The autonomous neurogenic bladder results from destructive lesions of the conus terminalis and cauda equina. Since the internal sphincter shares in the hypertonicity of the bladder, it acts as an outlet obstruction. As with any outlet obstruction, bladder decompensation and damage to the upper urinary tract will ultimately result if the condition persists for a sufficiently long time.

Modern treatment of the autonomous neurogenic bladder attempts to relieve the outlet obstruction. Presacral neurectomy has not proved satisfactory in our experience. Transurethral sphincterotomy yields more gratifying results, particularly if undertaken before the bladder has decompensated.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. EVANS, DRs. EMMETT AND BEARE
AND DRs. NESBIT AND GORDON

DR. WILLIAM P. HERBST, Washington, D. C.: The work that Dr. Evans did in recording nerve impulses was done on animals, and while that is suggestive as to what might occur in man I don't feel that we should take it as being identical and interpret the findings in animals and apply them to human beings. His explanation of the function of the bladder is about as simple as any I have heard or can conceive of and certainly should prove as satisfactory a guide to understanding and comprehension of various bladder dysfunctions as anything that we have had presented to us. Dr. Emmett and Dr. Beare have shown a bright spot in handling tabetic bladder patients with incontinence and retention. They have shown that resection is justifiable and not frequently enough resorted to. The work of Nesbit and Gordon demonstrates a sound idea of the handling of the problem of the atonic bladder. Here we have a bladder that can't empty itself on account of neck spasticity and by the simple procedure of removing this bladder neck obstruction one restores the patient to a much better status.

DR. LLOYD G. LEWIS, Baltimore: I agree with Drs. Emmett and Beare about the treatment of the tabetic bladder. For differentiation between the atonic bladders of vesical neck obstruction and of *tabes*, one needs temporarily to disregard bladder capacity and to study reflex activity by systometry. The normal bladder will forcibly contract when the intravesical pressure exceeds 12 mm. of mercury. In the tabetic patient the voiding reflex fails to develop, even when the pressure reaches 30 or 40 mm. of mercury. In the atonic bladder of obstruction there is a definite response to stretch on 12 mm. pressure, which can be seen in a recorded cystometrogram. I agree with Drs. Gordon and Nesbit in their treatment of automatic bladders. Dr. Evans's study of vesical activity by means of the oscillograph adds to our knowledge of reflex activity of the bladder. We are all aware of coordinated reflexes between the external sphincter and the detrusor. During urination, if the external sphincter is contracted voluntarily, relaxation of the detrusor automatically follows. Henle, Kohlrausch and Rosenthal in 1856 adequately described the bladder neck. At Young's suggestion Wesson studied and described the orderly arrangement of detrusor fibers around the vesical orifice. As far as I know there has been no anatomic description of a true internal sphincter. The prostatic musculature or so-called

sphincter medius is the only sympathetically innervated muscle surrounding the urethra. I cannot accept Learmonth's work on the innervation of the vesical orifice musculature. Learmonth observed the orifice from the posterior urethra during stimulation and section of the presacral nerve. I believe he described trigonal action on the shape of the orifice, rather than sphincteric action. How long must we hypothesize an internal sphincter innervated by the sympathetic nervous system? Henle described the longitudinal detrusor fibers which pass through the vesical orifice to insert in the posterior urethra. When they contract forcibly, the vesical orifice is advanced forward.

DR. HERBERT ELLIS LANDES, Chicago: The analysis of a large series of tabetic patients with bladder dysfunction presented by Drs. Emmett and Beare provides material of great clinical interest. They are to be congratulated on the amazing results obtained by bladder neck resection in these cases. Yet it is a little difficult to see why prostatic resection on the dilated internal sphincter should improve the ability to empty the bladder. I gathered from their statistics that a great many of these tabetic patients had some evidence of vesical neck obstruction, however, and that partial paralysis of the bladder resulted in a relatively high degree of obstruction in the presence of slight prostatic enlargement. Since the tabetic and the prostatic patient have about the same age incidence, the association of the two diseases is not infrequent. Dr. Wilkes pointed out in his paper that small amounts of obstruction produce residual urine out of all proportion to the size of the prostate in these cases. In this group one would expect beneficial results by surgery directed to the relief of mechanical obstruction.

DR. FREDERICK C. McLELLAN, New York: The investigation of Dr. Evans concerning bladder physiology is the necessary background for the understanding of abnormal bladder behavior resulting from disease of the central nervous system. He has clarified the so-called "filling" and "emptying" antagonistic function of the sympathetic and parasympathetic nerves and shown that the pelvic nerves contain the necessary pathways to carry on micturition. The sympathetic fibers play little, if any, part. Since bladder activity is controlled by a spinal cord reflex in the sacral region and inhibited or modified by suprasegmental levels, a study of bladder behavior in many respects parallels that of a somatic tendon reflex. Lesions of the suprasegmental levels may result in increased or involuntary bladder contractions, and, on the other hand, interruption of the essential reflex fibers may result in suppression of the reflex with bladder paralysis. Drs. Emmett and Beare have presented a review of tabetic patients with urinary complaints examined at the Mayo Clinic. They have noted that a certain number of patients, in addition to the paralyzed bladder musculature, have an organic obstruction at the bladder outlet and that this further increases the difficulty in evacuating the urine. Although the neck of the bladder in the atonic neurogenic bladder is usually relaxed and funnel shaped and the urethral resistance is lowered, the coincidence of the older age group makes the possibility of prostatic hypertrophy, carcinoma or fibrous contraction of the bladder neck a not uncommon complication. When trans-urethral resection is adequately performed, the function is improved. The papers of Drs. Nesbit and Gordon and Drs. Emmett and Beare are complementary in that they discuss the two types of bladder paralysis associated with interruption of the reflex pathways, complicated by an obstructing factor at the bladder neck. Whereas Emmett and Beare discuss the atonic neurogenic bladder, Nesbit and Gordon discuss the hyper-tonic or autonomous neurogenic bladder. The spastic so-called "internal sphincter" of the latter type is part of the general tonicity of the detrusor but may cause a definite obstruction to the outflow of urine which, without the obstruction, can be evacuated only by increasing the intra-abdominal pressure or by persistent overflow incontinence. Resection of the internal sphincter permits the urine to be forced more completely from the bladder and, with periodic attempts at emptying the bladder, the patient may be kept fairly dry.

DR. IRVING SIMONS, New York: By observing both sensory points and manometric pressures one can study the relation of true somatic hyperreflexia in neurologic diseases to true hyper-

tonia of the detrusor. One can also show that there is usually hyposensitivity in neurogenic hypotonia of the detrusor, often incorrectly termed tabetic cord bladder.

DR. JOSEPH P. EVANS, Cincinnati: I have but little to add except to express my appreciation of the opportunity of joining in this symposium, from which I have learned a great deal. Dr. Herbst has wisely pointed out that some of the work I presented was based on animal experiments and therefore might not be directly applicable to the present problem. I wish that I could join wholeheartedly with Dr. Lewis in relegating the internal sphincter mechanism to the realm of abandoned theory, because by so doing one can still further simplify the concept of bladder activity. The fact that the action currents running to the region of the bladder neck are the same as those running to the fundus would suggest that the entire fundus and so-called internal sphincter or bladder neck act in unison. It may well be that his explanation will prove to be the correct one. I find it difficult, however, to accept mechanical obstruction as the explanation of the retention that develops following transverse lesions of the spinal cord or following destruction of the conus. I do not say that the sympathetic system has nothing to do with bladder activity. Certainly some sensory discharge is carried over the sympathetic pathways, but it is my belief that under the circumstances of normal micturition the sympathetic system does not play an essential role, either motor or sensory.

DR. JOHN L. EMMETT, Rochester, Minn.: I agree with what Dr. Lewis has had to say in regard to the internal vesical sphincter. I believe many such conceptions must be eliminated from our minds before we can proceed in an orderly manner to discuss the physiology of the bladder. I have not been able to distinguish between a primary neurogenic atonic bladder and a secondary myogenic atonic bladder. Dr. Simons and I have had some friendly discussions by letter about this subject, but I am still of the opinion that I could show to Dr. Simons cystometrograms of severely atonic bladders in cases of long-standing obstruction of the vesical neck in which he could not tell whether the atonicity was a result of obstruction or a primary neurogenic lesion. Dr. Landes has asked a pertinent question. He asked why resection of the vesical neck should be performed on a patient in whom the vesical neck already is dilated. This is difficult to answer, but a case in point may somewhat answer the question: Approximately a year ago a man aged 63 came to the clinic for examination and treatment. Twenty years previously, examination at the clinic had disclosed a severe *tabes dorsalis* accompanied by an overflow type of urinary incontinence. The vesical symptoms were his chief reason for seeking medical treatment. A diagnosis of cord bladder was made, and the patient returned home. His next admission to the clinic, twenty years later, was because of complete urinary incontinence associated with foul, odoriferous urine that made it impossible for him to associate with other people, even though he was most careful to keep his rubber urinal clean. Examination disclosed the presence of between 1,500 and 2,000 cc. of residual urine. At cystoscopy the vesical neck was found to be so relaxed that the walls of the prostatic urethra made almost a right angle at the verumontanum. In spite of the relaxation of the vesical neck there was a small but definite enlargement of both lateral lobes of the prostate gland. It was difficult to see why resection of the vesical neck should relieve this patient, but it did. Only 8 Gm. of tissue could be removed, but after the operation the patient was able to empty his bladder completely by straining, using abdominal pressure and employing about four minutes to perform the act of micturition. He was taught to void at regular intervals four times daily. By this regimen he was able to empty his bladder completely, the overflow incontinence was eliminated completely and it was possible to eradicate the urinary infection.

DR. WILLIAM G. GORDON, Ann Arbor, Mich.: I should like to say one more word about the internal sphincter problem. I hope that I haven't implied that I subscribe necessarily to the idea that there is an internal sphincter; but, in the autonomous bladder, that portion of the detrusor behaves as an obstruction. I have used the term somewhat conventionally, but I am inclined to agree with Dr. Lewis in the interpretation that, if it exists at all, it is unimportant except under this particular set of circumstances.

SKELETAL SCLEROSIS IN CHRONIC
SODIUM FLUORIDE POISONING

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DETROIT

It is established that long industrial exposure to cryolite¹ or to crushed phosphate rock containing sodium fluoride as an impurity² eventually causes severe generalized sclerosis of the skeleton, the tendinous attachments of muscles and of other body tissues. It is known also that the enamel of the permanent teeth of children will be mottled in a characteristic manner³ if the children habitually drink water containing 1 part or more per million of fluorine salts such as sodium fluoride during the years in which the enamel of these teeth is being laid down.⁴

Since mottled enamel is cosmetically undesirable, considerable effort has been exerted to avoid the use of contaminated water, but it has been assumed that the use of such water was not followed by deleterious lesions elsewhere in the body. Recently, however, there have been reported from North Africa,⁵ India⁶ and Argentina⁷ cases of radiologically demonstrable skeletal sclerosis in which fluoride-contaminated drinking water appeared to be the only causative factor.

The present paper deals with an unsuccessful attempt to demonstrate skeletal sclerosis in the inhabitants of first one and then another community in central Illinois where the drinking water, drawn from deep wells, is known to be contaminated with fluoride.⁸

There are American communities in which the fluoride content of the public water supply is much greater than 3 parts per million, and throughout the country contamination of food is increasing because of the widespread use of the fruit and vegetable sprays containing sodium fluoride as the active agent and of phosphate fertilizer and stock food in which fluoride occurs as an impurity.⁹ Since skeletal sclerosis presumably is followed by sclerosis of the bone marrow, kidney and other vital tissues, it is desirable that the search for skeletal lesions should be continued.

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KEMPTON STUDY

The first study was conducted at Kempton, Ill., where the fluoride content of the drinking water appears to be variable over a range of from approximately 1.2 parts per million to 3 parts per million. In this community 86 subjects were examined, the ages ranging from 7½ to 71 years, the exposure to fluoride ranging from none to sixty-one years. In all cases a roentgenogram was made of the pelvis and the lower part of the lumbar spine and in some cases of other parts of the skeleton as well, but in no instance did we observe the occurrence of generalized sclerosis.

BUREAU STUDY

The second study was conducted at Bureau, Ill., where the fluoride content of the drinking water is approximately 2.5 parts per million. Thirty-one subjects were examined, the ages ranged from 18 to 78 years and the exposure to fluoride from eighteen to sixty-eight years. Here also there was no instance of generalized skeletal sclerosis.

Roentgen Technic.—Care was exercised to obtain films of good technical quality. The roentgen equipment consisted of a demountable table provided with a Potter grid and a 1.5 kilovolt shockproof roentgen ray tube connected to an oil-immersed step-up transformer without a rectifier. Films were made at 70,000 volts, 10 milliamperes, exposure time ranging from one second to eighteen seconds, depending on the measured thickness of the part, the exact exposure in each case being determined from an empirical curve which had been found to produce good quality roentgenograms of normal subjects. Films were processed for five minutes in standard strength commercial developing solution maintained at a temperature of 65 F., this work being carried on in a portable darkroom.

Interpretation of Roentgenograms.—As the work progressed, the films were examined and a provisional diagnosis was rendered. Subsequently all the films from both communities, together with films of normal subjects made with the field equipment in the field and in Chicago, were submitted to a group made up of radiologists and orthopedic surgeons.

Dental Observations.—The radiologic study at Kempton had been preceded by a survey¹⁰ in which typical mottling of the dental enamel was demonstrated in practically all the subjects who had been exposed to the contaminated drinking water during early childhood, and earlier studies by others¹¹ had shown typical mottling of the dental enamel of school children in Bureau.

CONCLUSION

1. The use of drinking water containing up to 3 parts per million of sodium fluoride apparently does not cause radiologically demonstrable sclerosis of the skeleton even though the water is taken for a long period of time.

2. As an aid in predicting the result of increased fluoride contamination of food, the search for skeletal sclerosis should be continued in American communities in which the fluoride content of the drinking water exceeds 3 parts per million.

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HISTORY AND PRESENT STATUS OF
OXYGEN THERAPY AND
RESUSCITATION

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During the past twenty years there has been a growing appreciation that oxygen therapy and resuscitation are valuable adjuncts in the physician's armamentarium. Although both are in the infancy of their development, their history may be traced through many years. In ancient times air was considered one of the four elements, and the clinical manifestations of many diseases were attributed to it. Early medical writings record the use of various procedures to stimulate respiration, the function of which was thought to be the cooling of the blood. Under such conditions it is little wonder that attempts to revive those apparently dead had a rather variable fate. The earliest and most successful of these methods was mouth to mouth insufflation, an example of which is found in the Bible.¹ Elisha is said to have restored to life the son of a Shulamite woman by breathing into the mouth of the child.

With the dawn of the seventeenth century many changes in medieval practices were effected. In 1628 Harvey² demonstrated the circulation of the blood. Boyle³ in 1666 proved conclusively that the presence of air was essential for life. Four years later Mayow⁴ observed that this same substance was necessary for the conversion of venous into arterial blood. Approximately a hundred years later, Priestley⁵ isolated the "nitro-aërial" substance of Mayow and called it dephlogisticated air. He did not fully realize the significance of his work, and it remained for Lavoisier to demonstrate that the gas was absorbed by the lungs, burned by the tissues and eliminated as carbon dioxide and water.

The discovery of oxygen aroused considerable interest in medical circles, and in 1798 Thomas Beddoes⁶ established his Pneumatic Institute at Clifton, where the gas was used in the treatment of many diseases. As a result of its abuse and misuse, considerable skepticism arose as to its actual therapeutic value, and during the next hundred years the procedures suffered from the unmerited neglect which eventually supervenes when a method is used as a panacea. However, experimental investigation during this period proved fruitful. Paul Bert⁷ explained the effects of high altitude on respiration as due to a reduction in the partial pressure of oxygen. Zuntz, Mosso⁸ and others elaborated on these observations. Araki⁹ and Walter¹⁰ noted the effects of ingestion of acid on blood and respiration. Cooper

pointed out the deleterious effects of cerebral ischemia.¹⁰ Claude Bernard observed the asphyxial properties of carbon monoxide.¹¹

In the meantime, resuscitation claimed the attention of the medical world. The high incidence of drowning in Holland prompted the organization of the Dutch Amsterdam Society in 1767 for the purpose of formulating reliable life-saving methods.¹² The procedures advocated by the Dutch were presented before the Royal Humane Society in England in 1773 by Cogan.¹³ The measures consisted chiefly of the use of heat, blood letting, rectal instillations of tobacco smoke, barrel rolling and mouth to mouth insufflation. Under the auspices of the two societies rules were formulated and the various methods were approved or discarded as experience proved their worth. In 1776 John Hunter¹⁴ recommended insufflation of air by means of bellows, a method previously suggested by Paracelsus in 1530. The procedure became very popular and the apparatus designed by Charles Kyte was readily accepted by the Royal Society.¹⁵ Hunter also suggested that oxygen, discovered only two years previously, might prove more efficacious in resuscitation than common air. With the publication in 1829 of Leroy's work on resuscitation of animals,¹⁶ the use of bellows fell into disrepute. Since then various mechanical devices have been introduced but for the most part have been considered, until recently, less efficient than manual methods. The most notable of the mechanical devices are the ones supplying intermittent negative pressure and those employing positive and negative pressure, both of which have a definite place in modern resuscitation. Manual resuscitation assumed a scientific basis with the advent of Hall,¹⁵ Howard¹⁶ and Silvester.¹⁷ Although clumsy, their methods were efficient and widely used until 1903, when Shafer¹⁸ described the currently popular prone pressure type of artificial respiration. Recently Nielsen¹⁹ added the "arm lift" to the method, making his a combination of the prone pressure and the Silvester procedure.

With the advent of the World War, the success of Haldane,²⁰ Meltzer,²¹ Barcroft, Hunt and Dufton²² in treating pulmonary edema and pneumonia with oxygen reestablished its use. Since then more efficient means of administering this gas have been developed. Clinicians have become more cognizant of the vicious cycle initiated by lack of oxygen, and the recognition and prompt treatment of this condition is considered a matter of paramount importance.

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Anoxia, as it is recognized today, may be divided into four classes, namely the anemic, the anoxic, the stagnant and the histotoxic form. In the anemic type the oxygen tension of the blood is normal but the oxygen content is limited, owing to a deficiency or some functional alteration of hemoglobin. This is best represented by the primary anemias. In the anoxic form, the hemoglobin is unsaturated because of a lowered oxygen tension. The associated reduced tension of carbon dioxide aggravates the condition as it tends to alter further the dissociation curve of oxyhemoglobin. It may result from breathing atmospheres containing a reduced content of oxygen at normal pressures or from any condition in which the alveolar ventilation is reduced. Stagnant anoxia is the end result of cardiac or circulatory failure. The oxygen content and the oxygen tension are essentially normal, but the tissues are inadequately supplied because of a retarded blood flow. This is the condition frequently seen in surgical or traumatic shock. Histotoxic anoxia is essentially a condition in which the cells are incapable of utilizing the available oxygen owing to poisoning. Examples are cyanide, alcoholic and carbon monoxide poisoning.

The direct effects of lack of oxygen have been well described by Barcroft,²³ Haldane²⁴ and others through studies made at high altitudes and in closed chambers in which the partial pressure of oxygen was reduced. Slight deficiency results in hyperpnea and an accelerated pulse rate. Moderate want is characterized by headache, nausea, vomiting and visual and respiratory disturbances. In acute deficiency there is delirium, fever, coma and eventually death. If the onset of anoxemia is insidious, the symptoms are often comparable to those of alcoholic intoxication. There is a feeling of well-being or exhilaration. Mental function is impaired. Emotional disturbances and amnesia are common. Ataxia and muscular weakness develop and are followed by an ascending muscular paralysis. The special senses are gradually lost, hearing being apparently the last to disappear. Unconsciousness occurs and death ensues.

The effect on breathing by a specific reduction of the oxygen content of the inspired air varies with the person and the speed of the reduction. In normal persons a reduction of 7 per cent is usually required to produce a noticeable effect. In others a similar reduction may produce a noticeable reaction. Ordinarily, a slight deficiency of oxygen acts as a stimulus to respiration. If continued, the increased breathing washes out an excess of carbon dioxide and lowers the alveolar and arterial tension of carbon dioxide, and there is a tendency toward production of an alkalemia. With the level of carbon dioxide reduced, respiration becomes quiet and remains so until the gradual accumulation of carbon dioxide in the blood acts as a stimulus. The cycle is repeated and breathing becomes periodic. If the anoxia is allowed to progress further, the apneic phase is gradually prolonged and death eventually occurs from fatigue of the respiratory center. When oxygen want is induced slowly, as in mountain climbing, and when sufficient time is allowed, acclimatization may occur. The alveolar and arterial tensions of carbon dioxide are substantially lowered owing to the rapid shallow breathing. In order to compensate for the alkalemia, and in order to maintain a high tension of oxygen, the kidneys excrete the excess base. If asphyxia develops rapidly, as may occur when an inert gas is

breathed, the initial period of hyperpnea is short and unconsciousness ensues quickly, since the tissues have no oxygen reserve to combat the lowered tensions of oxygen and carbon dioxide.

Similar changes occur in the circulating blood. Incipient anoxia produces dilatation of the coronary vessels²⁵ and a transient rise in the cardiac output and in the frequency of the pulse rate. These are merely compensatory mechanisms to insure an adequate supply of oxygen to the tissues by an increased blood flow. As anoxia progresses, the cardiac output gradually fails owing to lack of oxygen and the accumulation of waste products in the tissues. The latter is important as it tends to alter the hydrogen ion concentration of the blood, which in turn affects respiration. Breathing is stimulated by a rise and is depressed by a fall of the hydrogen ion concentration. With the former, the compensatory hyperventilation tends to alter the hydrogen ion concentration toward an alkalemia by eliminating the excess of carbon dioxide and carbonic acid. In the latter instance the reverse is true.

In addition to the circulatory and respiratory effects other functions may be impaired. The urinary output is lowered by moderate anoxia.²⁶ With prolonged want anuria may develop. The emptying time of the stomach is prolonged,²⁷ contractions²⁸ are reduced and gastrointestinal secretions are modified.²⁹ Besides these immediate effects delayed reactions may occur depending on the time and severity of the exposure. The typical nausea, vomiting and depression of mountain sickness may occur eight to twelve hours after exposure. Such experiences were common prior to the use of oxygen in aviation. Barach³⁰ and others have emphasized the dangers concurrent with flying and recommend the use of oxygen when altitudes of ten to twelve thousand feet are attained.

During many illnesses anoxia frequently complicates the course of disease. By having the superimposed anoxia relieved, the patient is definitely benefited. It is frequently on this basis that oxygen therapy is initiated. In pneumonia, the alveoli are filled with exudate and the lung or part of it is converted into a solid airless organ. As a result, diffusion of oxygen from the air is diminished and the vital capacity of the lungs is lowered. In addition, the presence of hyperpyrexia and toxemia increases the metabolic rate. With metabolism accelerated, the demands of the tissues for oxygen are greater. With the requirement for oxygen increased and the supply decreased, a vicious cycle is established. From a study of clinical records, Binger³¹ concluded that there is a definite correlation between anoxemia and mortality in pneumonia. Other observers have confirmed these observations. Early intervention is essential, as lack of cyanosis in the early stages of the pneumonic process does not infer an absence of anoxemia. Stadie³² has pointed out that the saturation of

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the blood with oxygen may drop 10 to 15 per cent below normal before cyanosis is perceptible. This is especially true in anemic patients. Evans³³ states that the efficacy of oxygen is practically in direct proportion to the day on which oxygen treatment is started. In the absence of cyanosis, a pulse rate out of proportion to the degree of hyperpyrexia, the presence of a grayish color and rapid shallow respirations are clearly indicative of anoxia.

In the presence of cardiac disease, impaired function ultimately results in defective circulation and pulmonary edema. Decompensation is accompanied by a lowered arterial and venous concentration of oxygen.³⁴ Peters and Barr³⁵ have reported changes in the dissociation curve for carbon dioxide and in the hydrogen ion concentration of the blood in advanced cardiac failure. Siebeck³⁶ has observed unequal pulmonary expansion in cardiac insufficiency, resulting in an imperfect mixture of the gases in the lungs. Barach³⁷ has described several cardiac conditions in which oxygen therapy has been beneficial, namely congestive heart failure due to primary cardiac disease, cardiac insufficiency as a sequel to chronic pulmonary disease, acute coronary thrombosis and coronary arteriosclerosis with chronic cardiac pain. In congestive failure due to primary cardiac disease, the most significant effects following inhalation of oxygen were decrease of cyanosis, relief of dyspnea and orthopnea and a sharp rise in the content of carbon dioxide in the blood. Associated changes are increased concentration of arterial oxygen, decrease in the concentration of lactic acid in the blood and decreased pulmonary ventilation. Oxygen therapy in cardiac insufficiency as a sequel to pulmonary disease yielded similar results. Currently, the pain of coronary thrombosis is thought to be due to myocardial ischemia. Lewis³⁸ has pointed out that pain results when the blood supply of a working muscle is inadequate. Rizer³⁹ in 1928 noted that the pain could be relieved by inhalation of oxygen. Kissin and Rothschild⁴⁰ have induced attacks of anginal pain by lowering the concentration of oxygen in the atmosphere breathed by patients suffering from coronary arteriosclerosis. Levy, Barach and Bruenn⁴¹ have reported decided relief of pain and subjective symptoms in similar patients following administration of oxygen. Patients with chronic cardiac disease such as those showing congenital defects develop a compensatory mechanism early in life and thus do not warrant oxygen therapy unless decompensation or infection supervenes.

An asthmatic attack produces insufficient oxygenation owing to lowered vital capacity, reduced available pulmonary surface for diffusion of gases, increased residual air and increased negative pressure within the thorax.

Oxygen therapy alone has not proved satisfactory because the volume of oxygen able to pass by the obstructed areas is small. When oxygen therapy has been combined with the administration of helium, significant benefits have been obtained. The use of helium is based on the fact that in diffusion through small apertures the mean free path of helium is greater than is that of nitrogen.⁴² Consequently, oxygen and carbon dioxide diffuse more readily through obstructed pulmonary areas in the presence of helium than in nitrogen. By connecting a delivery tube from a tank of helium and oxygen and from a tank of oxygen by means of a Y tube, the administration of these gases through a Boothby-Lovelace-Bulbulian mask is possible. Barach⁴³ recommends the use of mixtures of helium and oxygen under pressure. Roentgenographic studies revealed that the smaller bronchi are further enlarged at the end of expiration if positive pressure is used.

Oxygen is being administered after major surgical procedures more frequently than formerly. Moon states that anoxia is a factor of utmost gravity in the operation of the vicious cycle associated with shock. Boothby, Mayo and Lovelace⁴⁴ advocate the use of oxygen in concentration of 100 per cent in the treatment of surgical shock because there is an increase of 10 to 15 per cent in the concentration of oxygen in the circulating blood. Under basal conditions hyperthyroidism is frequently accompanied by a slight decrease in the concentration of oxygen in the arterial blood. Following thyroidectomy the administration of oxygen is followed by a definite relief of subjective symptoms. Fine and his associates⁴⁵ advocate the use of oxygen in high concentration in the treatment of distention occurring postoperatively on the basis that when pure oxygen is breathed the gradient of diffusion between the nitrogen existing in the tissues and that in the blood increases. Consequently, there is an increased rate of absorption of nitrogen from the tissues into the blood and thence into the air. On this basis the administration of oxygen following encephalography frequently produces a decrease in the severity and duration of the post-encephalographic syndrome. Schwab, Fine and Mixer⁴⁶ advocate the administration of oxygen both during and after the procedure, even when oxygen is used as the visualizing medium.

The question of dosage in oxygen therapy has received considerable attention. It would seem logical that a concentration should be used which is capable of abolishing the existing anoxia. However, experimental work has shown that animals exposed to concentrations of from 70 to 100 per cent for several days develop pulmonary lesions.⁴⁷ Paul Bert⁶ first noticed that if animals breathed pure oxygen at several atmospheres pressure they soon had convulsions and died. In man,

33. Evans, J. H., and Durshodwe, C. J.: Indications for Oxygen Therapy in Respiratory Disease, *Anesth. & Analg.* **14**: 162 (July-Aug.) 1935.

34. Means, J. H., and Newburgh, L. H.: Studies of the Blood Flow by the Method of Krogh and Lindhard, *Tr. A. Am. Physicians* **30**: 51, 1915. Lundsgaard, C.: Studies of Oxygen in the Venous Blood, *J. Exper. Med.* **27**: 179, 1918.

35. Peters, J. P., Jr., and Barr, D. P.: Carbon Dioxide Curve and Carbon Dioxide Tension of Blood in Cardiac Disease, *J. Biol. Chem.* **45**: 537 (Feb.) 1921.

36. Siebeck, R.: Ueber kardiale Dyspnoe, *Klin. Wchnschr.* **8**: 2121 (Nov. 12) 1929.

37. Barach, A. L.: The Therapeutic Use of Oxygen in Heart Disease, *Ann. Int. Med.* **5**: 428 (Oct.) 1931.

38. Lewis, Thomas: Pain in Muscular Ischemia: Its Relation to Anginal Pain, *Arch. Int. Med.* **49**: 713 (May) 1932.

39. Rizer, R. I.: Oxygen in Treatment of Coronary Occlusion: Preliminary Report, *Minnesota Med.* **12**: 506 (Aug.) 1929.

40. Rothschild, M. A., and Kissin, M.: Production of the Anginal Syndrome by Induced General Anoxemia, *Am. Heart J.* **8**: 729 (Aug.) 1933.

41. Levy, R. L.; Barach, A. L., and Bruenn, H. G.: Effects of Induced Oxygen Want in Patients with Cardiac Pain, *Am. Heart J.* **15**: 187 (Feb.) 1938.

42. Visscher, M. B.: The Physiology of Respiration, *Bull. Minnesota M. Foundation* **2**: 1 (Nov.) 1940.

43. Barach, A. L., and Swenson, Paul: Effect of Breathing Gases Under Positive Pressure on Lumens of Small and Medium Sized Bronchi, *Arch. Int. Med.* **63**: 946 (May) 1939.

44. Boothby, W. M.; Mayo, E. W., and Lovelace, W. R.: One Hundred Per Cent Oxygen: Indications for Its Use and Methods of Its Administration, *J. A. M. A.* **113**: 477 (Aug. 5) 1939.

45. Fine, Jacob; Banks, B. M.; Sears, J. B., and Hermanson, Louis: The Treatment of Gaseous Distention of the Intestine by the Inhalation of Ninety-Five Per Cent Oxygen, *Ann. Surg.* **103**: 375 (March) 1936.

46. Schwab, R. S.; Fine, Jacob, and Mixer, W. J.: The Reduction of Postencephalographic Symptoms by the Inhalation of Ninety-Five Per Cent Oxygen, *Arch. Neurol. & Psychiat.* **37**: 1271 (June) 1937.

47. Smith, L. J.: The Pathological Effects Due to Increase of Oxygen Tension in the Air Breathed, *J. Physiol.* **24**: 19, 1899. Karsner, H. T.: The Pathological Effects of Atmospheres Rich in Oxygen, *J. Exper. Med.* **23**: 149, 1916. Schmiedehausen, P. G.: Die pathologisch-anatomischen Veränderungen der Lungen bei verändertem Sauerstoffgehalt der Atemluft, *Inaug. Dissert.*, Halle, Vischian & Burkhardt, 1909. David, O.: Versuche über den Einfluss sauerstoffarmer Luft auf künstlich geschädigte Lungen, *Ztschr. f. exper. Path. u. Therap.* **11**: 239, 1912.

Benke and Shaw demonstrated that the continuous administration of pure oxygen at one atmosphere was capable of producing untoward effects after six hours.⁴⁸ On this basis oxygen was formerly seldom given in concentrations over 60 per cent. Evans,³³ however, pointed out that the use of such concentrations were inefficient and that higher concentrations were warranted. Sayers found that pure oxygen can be administered for ten hours in man and for sixteen hours in animals without apparent harm.⁴⁹ Barach⁴⁹ confirmed these observations and recommended that pure oxygen should not be given for more than twelve hours a day. Recently, Boothby, Mayo and Lovelace⁴⁴ reported the use of oxygen in high concentrations in more than 800 cases without evidence of pulmonary irritation, but they suggest that the duration of treatment should not exceed forty-eight hours.

Currently there are four popular methods of administering oxygen, namely by means of the intranasal catheter, the mask, the tent and the chamber. Use of an intranasal catheter is an effective method provided the oxygen is efficiently humidified. A flow of 5 to 8 liters provides a concentration of 40 to 60 per cent in the inspired air. To prevent excessive irritation of the nasopharynx and to insure an adequate concentration, the catheter must be well lubricated and properly placed. If it is inserted too deeply there is a tendency for the patient to swallow; if withdrawn too far lower concentrations are obtained at equivalent rates of flow. The best results are obtained by anchoring the catheter at the level of the uvula.⁵⁰ If properly controlled, a tent is a satisfactory means for administering oxygen in concentrations up to 60 per cent. To be effective, frequent checks for adequate ventilation, temperature, humidity and concentration of oxygen and carbon dioxide must be made. Unless this is done, the procedure is both costly and dangerous for the patient. In many ways the administration of oxygen in a chamber is ideal. The patient is comfortable and free from the psychologic effect of knowing that he is receiving oxygen. The disadvantages are the initial expenditure and the greater fire hazard. When concentrations above 60 per cent are warranted, administration by means of a mask is the method of choice. The mask is easily applied, few adjustments are necessary and high concentrations may be obtained with a relatively low rate of flow. Either the basal or the oronasal mask may be used. The former seems more desirable from the standpoint of comfort, but the latter is more efficient when oral breathers are encountered.

We have considered oxygen only as a secondary factor complicating the course of a disease. Our ancestors encountered and thought of asphyxia chiefly in terms of drowning and of foreign bodies within the trachea. The development of the gasoline engine, the ever increasing use of coal, oil and gas in industrial and home life, the widespread use of anesthetic agents and the overcrowding of metropolitan areas have added further hazards. In turn, man has responded by obtaining a more thorough knowledge of the principles of resuscitation. Currently, manual resuscitation by the prone pressure method of Schafer and mechanical means by controlled positive and negative pressure are in vogue. There is considerable diversity of opinion as

to which offers the maximum in effectiveness.⁵¹ There are many who advocate manual methods since they are available, easy to apply and, with an inexperienced operator, less apt to be detrimental to the patient. Mechanical means in experienced hands have a great deal to offer, especially when artificial respiration must be maintained over a long period of time.

Of the manual procedure, Schafer's method is preferred in this country. The prone pressure position promotes the clearing of the pharynx and trachea of foreign material, is easy to perform and carries a minimal amount of risk to the patient. Increasing pressure over the lower ribs produces expiration, while expiration depends on the elastic rebound of the compressed parts. A recent operation or a pregnancy contraindicates the use of this procedure, the method of choice under these circumstances being that of Silvester. Physiologically the Nielsen "arm lift," which aids both phases of respiration, should produce the best results. Expiration depends on pressure over the shoulder blades, and inspiration is aided by the operator lifting the patient's arms. This provides a maximal expansion of the chest. As pressure over the shoulder blades may prove harmful, Drinker and Shaw⁵² have suggested the combination of the prone pressure and the Nielsen method if two operators are available. While one applies pressure over the lower ribs, the other lifts the arms as the pressure is released. Mouth to mouth insufflation has many adherents. It permits an exchange of gases under proper conditions as to temperature, content of moisture and carbon dioxide. Waters and Bennett⁵³ state that it is the method to employ first in severe asphyxia. They prefer it to either the Silvester or the Schafer procedure. Satisfactory results may be obtained by administration of oxygen or mixtures of oxygen and carbon dioxide by means of a simple inhalator in conjunction with the prone pressure method.

Mechanical resuscitators are of two types: those employing intermittent positive pressure and those providing alternating positive and negative pressure. In the former expiration depends on the recoil of the distended parts, while in the latter the additional aspirating action due to negative pressure aids expiration. The principle involved in both has aroused considerable controversy. It is well known that excessive intrapulmonary pressure may produce irreparable damage. Positive pressure has been condemned by some because the force necessary for inflation in the presence of atelectasis or obstruction exceeds the upper margin of safety. Polak and Adams in experimental work on dogs have used pressures as high as 8 mm. of mercury without apparent harm.⁵⁴ In man, pressures of from 30 to 40 mm. of mercury are conceded to be safe. Coryllos⁵⁴ advocated the use of pressure, stating that it is the only means whereby successful insufflation with oxygen may be produced when muscular tone is lost. The value of the cupping action due to negative pressure is debatable, some observers holding that it has

48. Beecher, H. K.: *The Physiology of Anesthesia*, New York, Oxford University Press, 1938, p. 126.

49. Barach, A. L.: *Recent Advances in Inhalation Therapy in the Treatment of Cardiac and Respiratory Disease*, New York State J. Med. 37: 1095 (June 15) 1937.

50. Wineland, A. J., and Waters, R. M.: *Oxygen Therapy: Insufflation into Oral Pharynx*, Arch. Surg. 22: 67 (Jan.) 1931.

51. Coryllos, P. N.: *Mechanical Resuscitation in Advanced Forms of Asphyxia*, Surg., Gynec. & Obst. 66: 698 (April) 1938. Report of the Commission on Resuscitation from Electric Shock, New York, National Electric Light Association, 1913. *Proceedings and Resolutions of the Third Resuscitation Commission*, Science 48: 563 (Dec. 6) 1918. Wilson, R. A.; Tarrey, M. A., and Johnson, K. S.: *The Initiation of Respiration in the Newborn*, Surg., Gynec. & Obst. 65: 601 (Nov.) 1937. Moncrieff, A.: *Respiratory Failure Including So-Called Asphyxia Neonatorum* (Goulstonian Lecture), Lancet 1: 664 (March 23) 1935. Henderson, Vandell: *Fundamentals of Asphyxia*, J. A. M. A. 101: 261 (July 22) 1933.

52. Drinker, C. K., and Shaw, L. A.: *Modification of the Nielsen Method of Artificial Respiration*, J. Indust. Hyg. 17: 243 (Nov.) 1935.

53. Waters, R. M., and Bennett, J. H.: *Artificial Respiration*, Am. J. & Analg. 15: 151 (May-June) 1936.

54. Coryllos, P. N.: *Mechanical Resuscitation in Advanced Forms of Asphyxia*, Surg., Gynec. & Obst. 66: 721 (April) 1938.

a harmful effect on the alveoli and prohibits an adequate exchange of gases during expiration by constricting the smaller bronchi too rapidly. The efficiency of both methods may be enhanced by the use of a well lubricated soft rubber intratracheal catheter to assure a patent airway. Prolonged intubation should be avoided, as it is conducive to tracheitis. If used in conjunction with the application of positive pressure a stomach tube should be passed to prevent gastric distention. When artificial respiration must be maintained over a long period, as in the presence of intercostal paralysis, the efficacy of the Drinker or Emerson respirator is beyond question. If the lungs are collapsed or respiration has not been initiated, the apparatus is of little value.

The patient asphyxiated with carbon monoxide presents a rather complex problem. The affinity of carbon monoxide for hemoglobin is two hundred and ten times that of oxygen.⁵⁵ It combines readily and forms a more stable compound with hemoglobin than does oxygen. Because of its high affinity for hemoglobin even low concentrations in the inspired air are dangerous. The essential features of carbon monoxide poisoning are lowered concentration of oxygen, reduced tension of carbon dioxide, depressed respiration and loss of bodily heat. The most effective physiologic means for breaking down the combination of hemoglobin and carbon monoxide is offered by the mass action of oxygen; the most effective stimulus is carbon dioxide. In mild poisoning, the use of oxygen alone produces good results, as ventilation is adequate and no further stimulus to respiration is needed. In such cases Sayers and Yant⁵⁵ advocate the use of pure oxygen, stating that it is more efficacious than are mixtures of carbon dioxide and oxygen in preventing occurrence of delayed symptoms. As asphyxia progresses, the threshold for stimulation of the respiratory center rises and respiration becomes depressed. The rationale of using carbon dioxide is based on two facts: First, it produces adequate ventilation by its action on the respiratory center; second, it has a desirable effect on hemoglobin, facilitating the release of oxygen to the tissues. Ordinarily, concentrations of 5 to 7 per cent are employed.⁶⁶ A discussion of the value of various drugs as respiratory stimulants in asphyxia is beyond the scope of this paper. At present both experimental and clinical evidence seems to indicate that they are of little value.

The first inspiration of the newborn is essentially a resumption of a function previously established in utero.⁶⁷ Suppression of this function has been attributed to many factors. Eastman⁶⁸ in 1930 reported that the blood of many asphyxiated newborn infants contained a high tension of carbon dioxide and a low content of oxygen. On this basis he suggested that the failure of respiration was due to impairment of the respiratory center from anoxia and not from lack of chemical stimulation. Snyder and Rosenfeld⁶⁹ have shown that mater-

nal anoxemia produces a depression of fetal respiration without the preliminary stimulating effect which occurs in adults. When severe anoxia or narcotization occurs, complete cessation may occur. They also observed that lowering the carbon dioxide tension produced respiratory depression, while raising the tension above normal failed to stimulate breathing. In addition to these factors, it must be remembered that at birth cerebral compression, hemorrhage, mechanical interference with the fetal circulation or incomplete dilatation of the lungs may produce or aggravate an existing anoxemia.

The asphyxiated newborn infant should be handled gently and as little as possible. The mouth and nasopharynx may be cleaned of mucus by postural drainage and aspiration with a catheter. If necessary, the catheter may be inserted into the trachea blindly or under direct vision with a laryngoscope. Warm tubing is advocated, but cold tubing should never be employed, as the baby's heat must be conserved and not dissipated. If aspiration, application of external heat and cutaneous friction fail to stimulate respiration, oxygen should be given immediately by intermittent positive pressure. In some instances mouth to mouth insufflation may be indicated. Once breathing has been initiated, oxygen should be continued until respirations are full and regular. If respiration continues to lag or if pulmonary ventilation is deemed inadequate, the infant should be transferred to an incubator equipped as a chamber for the administration of oxygen.⁶⁰ Wasson,⁶¹ Van Reuss⁶² and Henderson⁶³ have reported that frequently complete expansion of the lungs may not occur for several days. Therefore, continuation of treatment during this period is essential.

COMMENT

A knowledge of the efficacy of the administration of oxygen has been gained through the efforts of many investigators. Regardless of the method employed, ultimate success of treatment with oxygen depends on early intervention. The reserve supply of oxygen within the body is capable of maintaining life for only a few minutes. Once this supply is exhausted, irreparable damage to the central nervous system may occur within a comparatively short time. Delay in instituting artificial respiration or in administering oxygen may result in death or in the production of a deranged mind within a sound body.

ABSTRACT OF DISCUSSION

DR. ALVAN L. BARACH, New York: I am pleased that oxygen therapy is about to be formally introduced as a part of anesthesiology. It seems fitting that the specialty of anesthesia, which includes relief of pain, should extend itself to relief of dyspnea. Oxygen therapy exercises the effect of reducing the volume of breathing in anoxic dyspnea. Its special value is in maintaining a rich oxygen supply to the tissues of the body, primarily to the brain. As the authors point out, the brain is the most sensitive organ to oxygen want. Helium is a light gas, which, when mixed with oxygen, can be breathed through narrow orifices at a pressure approximately one-half that required for the movement of either air or pure oxygen. This fact has been made use of in the treatment of asthma and localized obstruction. It has been pointed out that the viscosity of helium is slightly greater than nitrogen and that, if helium was to pass through a tube that was prolonged so that frictional resistance took place, the function of helium would not be

55. Sayers, R. R., and Yant, W. P.: The Elimination of Carbon Monoxide from Blood by Treatment with Air, with Oxygen, and with a Mixture of Carbon Dioxide and Oxygen, *Pub. Health Rep.* 38: 2053 (Sept. 2) 1923.

56. Heller, E.; Killiches, W., and Drinker, C. K.: The Evaluation of Five and Seven per Cent Carbon Dioxide Mixtures as Respiratory Stimulants, *J. Indust. Hyg.* 11: 293 (Nov.) 1929. Drinker, C. K., and Shaugnessy, T. J.: The Use of 7 per Cent Carbon Dioxide and Ninety-Three per Cent Oxygen in Treatment of Carbon Monoxide Poisoning, *ibid.* 11: 301 (Nov.) 1929. Haggard, H. W., and Henderson, Yandell: Treatment of Carbon Monoxide Poisoning, *J. A. M. A.* 77: 1065 (Oct. 1) 1921.

57. Snyder, F. T., and Rosenfeld, Morris: Intra Uterine Respiratory Movements of the Human Fetus, *J. A. M. A.* 108: 1946 (June 5) 1937.

58. Eastman, N. J.: Fetal Blood Studies: Oxygen Relationships of Unclashed Cord Blood at Birth, *Bull. Johns Hopkins Hosp.* 47: 221 (Oct.) 1930.

59. Snyder, F. T., and Rosenfeld, Morris: Direct Observations of Intra-Uterine Respiratory Movements of the Fetus and the Role of Carbon Dioxide and Oxygen in Their Regulation, *Am J Physiol.* 119: 153 (May) 1937. Footnote 57.

60. Warnock, E. H., and Tovell, R. M.: Oxygen Therapy and Resuscitation, *Anesthesiology* 1: 187 (Sept.) 1940.

61. Wasson, W. W.: A Roentgenographic Study of the Infant Chest as Seen at Birth, *J. A. M. A.* 83: 1240 (Oct. 18) 1924.

62. Van Reuss, A. R.: Diseases of the Newborn, New York, William Wood & Co., 1929, p. 304.

63. Henderson, Yandell: Incomplete Dilatation of the Lungs as a Factor in Neonatal Mortality, *J. A. M. A.* 96: 495 (Feb. 14) 1931.

advantageous. The main use of helium is in respiratory obstruction, in which it has the special physiologic value of lowering the pressure in the chest required for the movement of air in and out of the lungs. Positive pressure is used not only in asthma and in localized obstruction but in edema of the lungs, and this is of special importance at this time, when we are faced with the possibility of war gas poisoning. Edema of the lungs occurs not only as a complication of certain medical and surgical illnesses but also during anesthesia. It has been found that a pressure of 5 or 6 cm. of water, applied to the inside of the lungs by inhaling oxygen through a hood or through a mask, will stop exudation of serum, frequently within a short period. One has to bear in mind that excess pressure will prevent blood from entering into the right heart. But pressures of 5 and 6 cm. of water will in many instances prevent edema of the lungs, and that is something to remember in case one ever comes to a point where irritative gases cause an increased exudation of serum.

DR. FREDERICK A. D. ALEXANDER, Albany, N. Y.: There are some three thousand references in the literature to gas therapy and resuscitation. The authors have picked from this mass of information the most pertinent and the most important. It seems to me that oxygen therapy needs no brief at this time. It is thoroughly established and recognized everywhere. I wonder if we might not to better advantage think more of resuscitation, which, although it is much older than gas therapy, has been more or less taken for granted. More of our efforts, more of our thoughts should be given to resuscitation. As Dr. Barach has suggested, we may need to know a great deal more about resuscitation within the next few months or years. I should like to present a reclassification of the various types of oxygen want. All are familiar with Barcroft's classification of anoxia: anoxic anoxia, anemic anoxia, stagnant anoxia and histotoxic anoxia. The term anoxia is as incorrect as was the term asphyxia generally applied to oxygen want or as was the intermediate term anoxemia. There is no such thing as anoxia in clinical medicine. Any patient who has no oxygen in the blood stream cannot possibly survive. I propose the classification based on the site of the disturbance of the transport of the physiologic gases, with the term "hypoxia" rather than anoxia: atmospheric hypoxia, respiratory, cardio-circulatory, hemic and histotoxic: atmospheric, such as is seen occasionally in anesthesia; respiratory, as in upper respiratory obstruction or at the alveolocapillary membrane or in peripheral respiration insufficiency; cardiocirculatory, in circulatory disturbances where the difficulty is in the heart or in the vessels; hemic, such as we might see with anemia or with the use of the dyes where the hemoglobin has been, temporarily at least, prevented from transporting oxygen.

DR. RALPH T. KNIGHT, Minneapolis: I should like to ask Dr. Barach to amplify one of his statements with regard to the pressure, so that I will understand it more clearly. He showed us that a slight increase in pressure very much increases the passage of either helium-oxygen or oxygen alone through small passageways. If that is true, it seems to me that this increased pressure would also impede the exit from the lungs and would therefore impede ventilation. If we are using a pure oxygen, this would not interfere with the physiology to any extent except that it would reduce the output of carbon dioxide. If we are using helium and oxygen, it occurred to me to wonder whether in such an instance the helium would not accumulate in the lungs to the detriment of the presence of oxygen.

DR. BARACH: Patients with emphysema or asthma during the period of distress manifest a very severe dyspnea, breathing out against partially closed lips. I once had the occasion to ask such a man to open his mouth and breathe, and he swiftly went into an even more violent dyspnea. That was largely responsible for the use of positive pressure in our clinic. Dr. Swenson and I put iodized oil into the bronchi of patients with asthma and then had them breathe naturally and under positive pressure; we showed by x-ray films an increase in the diameter of the bronchi during expiration as a result of this positive pressure reflected backward through the bronchial tree, which tended to keep the bronchi open. There is an increased effort during expiration to exhale the gas against a positive pressure. This, however, is an effort which has peculiar advantages to the

patient not only in keeping his bronchi open but in preventing edema of the lungs. I have mentioned in an article in THE JOURNAL on the use of helium the physiologic advantages of grunting and groaning. If one sees a patient with lobar pneumonia in dyspnea, one is impressed with the enormous positive pressure developed during the expiratory grunt, which we have measured in a tracheotomized subject. It may go as high as 20 mm. of mercury, very often 10 or 15, during expiration. That pressure against the capillary wall prevents oozing of serum. I had the misfortune once to give such a man, who I thought was suffering from severe dyspnea, enough morphine to stop completely his expiratory grunt and witnessed the development of the edema of the lung within a period of three quarters of an hour afterward. The pulmonary ventilation is the same or slightly lower with positive pressure. The tidal air comes in, 500 cc., but it goes out in such a way, owing to the opening of the tracheobronchial tree by pressure, that a more uniform ventilation of the lungs takes place, especially in areas of the lung that may have been closed by partially collapsed alveolar ducts and plugged bronchi.

DR. RALPH M. TOVELL, Hartford, Conn.: I should like to mention the physical principles involved in the administration of helium. I quote Visscher from an article of his entitled "The Physiology of Respiration," published in the November 1940 issue of the *Bulletin of the Minnesota Medical Foundation*: "The use of helium is based on the fact that, in diffusion through small apertures, the mean free path of helium is greater than is that of nitrogen." This is an interesting concept that had been appreciated by Barach.

TUBERCULOSIS CASE FINDING

A PRACTICAL AND SUCCESSFUL PROGRAM FOR NONMETROPOLITAN AREAS

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In the literature of tuberculosis case finding there are only a few reports dealing with nonmetropolitan areas. Probably the main reason for this lack is the absence of case-finding programs in most such areas. Yet there is as much need for effective tuberculosis control in nonmetropolitan areas as in areas of highly concentrated population. Hence I present this report on a case-finding clinic in successful operation for five years in a nonmetropolitan county in Ohio. Richland County has a population of approximately 74,000, equally divided between the one urban district of Mansfield and the rural districts.

Late in 1935 Dr. Millard Hanson, then the health commissioner of Richland County, sought and obtained funds from the local tuberculosis association to establish a case-finding clinic. He asked me to take charge of the program. A set of regulations was drawn up which made it an integral and permanent function of the health department and provided for the active participation of the private physicians in the county. These regulations were submitted for approval and passed by the county medical society. The clinic which was established is intended to be a chest disease clinic rather than exclusively a tuberculosis clinic. Private physicians are invited to refer any patient with evidence of a pathologic condition of the chest that otherwise could not be definitely diagnosed, as well as patients in whom they suspect tuberculosis. Thus the clinic is able to aid the physician to solve his problems in diagnosis of diseases of the chest, and at the same time it provides an opportunity for examination of the group of patients known

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to be the most fertile source of tuberculosis. The clinic is scheduled regularly and provides each patient with a roentgenogram of the chest, pertinent laboratory tests and a physical examination of the chest by the clinic physician. Only patients referred by a physician or by the health commissioner are accepted by the clinic. They are classified as suspects. In order that the patient-physician relation may be maintained, the results of the examinations are mailed to the referring physicians and are not given to the patients.

There is another group of clinic patients, the tuberculosis contacts. The regulations permit the clinic nurse to visit the family of a tuberculous patient to urge the contacts to be examined. This is surely a matter of primary importance. Yet the private physician cannot be held responsible for this job, either because he does not fully appreciate its value or because he is not in a position to carry it out. If the contacts are under 12 years of age they are given a tuberculin test, and only contacts with a positive reaction have roentgenograms made of the chest. Since it is also essential to follow up the contacts, they are asked to return for recheck examinations at varying intervals for varying periods of time determined by the epidemiologic factors in the individual case. When a patient presents evidence justifying a diagnosis of inactive tuberculosis he also returns for periodic recheck examinations. When, however, a patient is found to have active tuberculosis the report to the referring physician includes recommendations for treatment but his further observation is not considered within the province of the case-finding clinic, since according to state law he is entitled to aid from the general tax funds.

The health department provides the services of a nurse exclusively for the clinic. Obviously, the success of the program depends on the cooperation of the physician in private practice, the health commissioner and the tuberculosis association.

In order to measure the results of this case-finding program several criteria have been selected.

1. Is the clinic actually investigating a reasonable percentage of the reported cases of tuberculosis in Richland County? In the first year of the clinic in only 56 per cent of the 48 cases of tuberculosis reported to the health department was diagnosis made in the clinic, while in the fifth year in 93.8 per cent of the 49 reported cases diagnosis was made there.

2. Is the management of the clinic economically sound? This is of fundamental importance and may be measured by the number with tuberculosis found in each hundred patients examined. I shall also consider the percentage with disease of the chest other than tuberculosis, since the clinic is primarily a chest disease clinic. If the incidence of tuberculosis among the patients examined is too high it indicates that the clientele is so highly selected that it does not include a great many of the very persons for whom one is looking, namely all the persons in a given district who have tuberculosis. Conversely, if the incidence of tuberculosis is too low it indicates that the wrong persons are being examined and that the cost per case found is unjustifiably excessive. During the five years of operation of the Richland County clinic 1,270 new patients were examined, 175 (13.7 per cent) of whom had active tuberculosis. Of the 175, 155 had pulmonary tuberculosis. The yield for the five years is too high, although the rate has been decreasing each year since the clinic was founded. This high rate is not an index

of an excessive incidence of tuberculosis in Richland County, since the death rate during the past five years has averaged 24 per hundred thousand. However, it shows that physicians must be encouraged to refer a larger number of patients to the clinic for examination. In addition to the 175 patients with active tuberculosis, 47 were found to have inactive pulmonary tuberculosis and 156 nontuberculous pulmonary disease, making a total of 378 with some kind of pathologic condition of the chest, or an incidence of 29.7 per cent among the 1,270 new patients examined. The nontuberculous pulmonary diseases included bronchitis, nontuberculous pleurisy, pneumonitis, empyema, bronchiectasis, abscess, carcinoma, silicosis and cystic disease.

3. Has there been an increasing percentage of patients whose disease has been diagnosed in an early stage? The tuberculous patient with incipient disease may be considered as probably noninfectious and the patient with moderately advanced disease as possibly infectious, while the patient with far advanced disease is almost certainly infectious. My aspiration is to attain a falling percentage of patients with far advanced disease and a rising percentage with incipient disease. During the five years the percentage with far advanced disease among the patients having pulmonary tuberculosis has decreased from 77 to 43, and the percentage with incipient disease has risen from 13 to 34. This is progress in the right direction.

4. Has it been profitable to examine the contacts? Among the contacts who have tuberculosis, the percentage with incipient disease should be large, even though a relatively small number have tuberculosis. Among both new patients and patients returning for recheck examinations during the five year period, 31 contacts were found to have tuberculosis, of whom 18 (58 per cent) had the disease in its incipient stage. In the group of suspects 144 had tuberculosis, 32 (29 per cent) in the incipient stage. Thus the incidence of incipient tuberculosis is two times greater among the contacts than among the suspects. This is convincing proof of the importance of examining contacts in the attempt to discover the disease in the incipient stage.

5. Has the program stimulated public interest? Since the case-finding program is supported by the sale of Christmas seals, the total annual sales should offer an index to public interest. Each year the sales have increased. In 1940 the per capita sale in Richland County was three times the average for the five years preceding the founding of the clinic, and in 1940 was 60 per cent above the per capita sales in the state, whereas in the five years prior to establishment of the clinic the average per capita sales in Richland County had been only 12 per cent above the average for the state as a whole. Another example of the public's approval of the program is the passage of a tax levy to provide more funds for the treatment of tuberculous patients. The finding of many new patients requiring treatment resulted in increased demands for money from the general tax receipts. In order to meet these needs the county commissioners submitted to the electorate at the 1938 elections a proposed five year 0.5 mill tax levy to be used exclusively for the treatment of tuberculous patients who were legal residents of Richland County. The levy was approved and provides an annual revenue which is five times the average annual appropriation for the treatment of tuberculous patients during the ten years preceding the founding of the clinic.

The following lessons may be derived from the Richland County experience:

1. There is no reason to defer the setting up of a case-finding program because there is no sanatorium in the district. That the case-finding clinic is only a part of the tuberculosis control program is true. To complete the control program, the care and rehabilitation of the tuberculous patient must be provided for. But I am firmly convinced that a local sanatorium is neither a prerequisite nor a necessity for developing either a case-finding clinic or a complete control program. In fact, I believe that the tuberculosis hospital as a county project is not economically sound except in metropolitan areas. But the need for a case-finding program in non-metropolitan areas does exist. I believe that case finding is the horse that pulls the cart of the control program.

2. The program should be based on the county unit and should be operated as a permanent and integral part of the county health department, and, if any exist, of the city health departments. The county unit is of workable size. The health departments possess established organizations. Tuberculosis is a communicable disease, and measures for its control are the responsibility of the health department.

3. The program should be run in cooperation with private physicians in essentially the manner outlined. The finding of a communicable disease such as tuberculosis is not likely to attain highest effectiveness in any other way, surely not without the expenditure of much larger sums of money per case found. With the private physician cooperating by sending his patients suspected of having disease of the chest to the clinic for examination, the most fertile field for discovering cases can be exploited. Thus there is a logical and reasonable division of labor between the private physician and the clinic, with neither encroaching on the other's domain and each supplementing and complementing the other.

4. The clinic physician must be a specialist adequately trained in the characteristics of diseases of the chest and familiar with the epidemiology of tuberculosis. He does not necessarily have to be a resident of the county. In fact, a good many difficulties can be avoided if he is not in competition in his private practice with physicians practicing in the clinic area.

5. With such a program as I have outlined, it is possible to keep the cost per case found within reasonable limits and still approach an adequate coverage of the area. Aided by the repeated examinations of contacts my clinic is discovering an increasing percentage of cases of tuberculosis in the incipient stage, which is as vital to the effective control of the disease as to the hope of cure for the individual patient.

6. Lastly, it is possible—and desirable—to educate the public in the control of tuberculosis at the same time as the actual diagnosing goes forward. The finding of cases offers concrete evidence of the presence of the disease and demonstrates the possibility of controlling it. It cannot be too strongly emphasized that the creation of an enlightened and intelligent attitude toward the control of tuberculosis is one of the chief functions of any clinic. The way to treat any communicable disease is to bring it into the open and explain to the public how it is caused and how it can be prevented. Once the public understands what must be done and that it is possible to do it economically and without fuss, it will gladly lend its assistance to a program of control.

I think it best to obtain funds for case-finding work from the sale of Christmas seals, because the average

citizen is interested in the fate of the dollar which he spends for them. After a favorable public attitude so necessary for effective work is created, tax funds will probably be provided for the continuation and the necessary and reasonable expansion of the control program. I am firmly convinced that the New York state plan offers the best ultimate solution for the control of tuberculosis in the nonmetropolitan counties of Ohio and probably in most states. But it should not and will not materialize until enough of the nonmetropolitan counties have paved the way with sound case-finding programs.

This report describes one concrete attempt to solve the problem of tuberculosis control in nonmetropolitan counties and is presented with the hope that physicians and health officers may be encouraged to set up similar programs. The Richland County program almost certainly does not represent the final answer to the problem. But its success so far makes me believe that it is a long step in the right direction.

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ABSTRACT OF DISCUSSION

DR. ROBERT E. PLUNKETT, Albany, N. Y.: Physicians in charge of chest clinics too frequently fail to appreciate the importance of establishing appropriate relationship with practicing physicians. Nothing is more basic and more important than that the chest clinic have the active support of the practicing physicians. The more completely a clinic service is integrated with the field of medical practice, the greater will be the returns in profitable case finding and control. In the absence of such integration, optimum results can never be achieved. This statement is made after more than twenty years' experience in a service in which one of the requisites is cooperation with the medical profession. Such cooperation has resulted in virtually 100 per cent of the physicians practicing in the areas served by the New York State Department of Health clinics actively participating in our tuberculosis case finding and follow-up program. Dr. Bliss has wisely recognized the importance of this fundamental factor. It is obvious that because of this recognition the results which he has achieved have in no small part been due to this common understanding and the resultant good will of the practicing physicians. Superficially, Dr. Bliss's statement that 13.7 per cent of 1,200 new patients who were examined showed evidence of active tuberculosis is somewhat startling. It is apparent that a yield so much higher than the average in clinic service indicates some unusual condition. This point is emphasized by Dr. Bliss when he states that the rate is not an index of an excessive incidence of tuberculosis in Richland County. In other words, this percentage yield is probably due to the highly selected group of patients who had been referred to his clinics for examination. I am confident that as his program is extended, and it should be, this percentage yield will become much smaller but none the less profitable to the public health. It has been my experience that except for highly selected segments of the population, such as Dr. Bliss reports on, the percentage yield in clinically significant pulmonary tuberculosis has been found to be greater among patients referred to a clinic because of history of contact, plus those referred because of symptoms, than in any other group. It is impossible to overemphasize the importance of tuberculosis in the adult age groups. The New York State Department of Health has recognized the need for supplementing routine clinic service by the roentgenographing of groups of the adult population. When the present national emergency arose, plans were formulated to roentgenograph all men before they were inducted into military service as a part of the National Selective Service Act. An extensive study prompted the division to conclude that of the available methods for producing chest roentgenograms, namely 14 by 17 inch celluloid films, 14 by 17 inch paper roentgenograms and 4 by 5 inch and 35 mm. roentgen-photographic films, the 4 by 5 roentgen-photographic film is the most economical and most practical method for screening large groups of people.

ADIPOSOGENITAL DYSTROPHY

RALPH H. KUNSTADTER, M.D.

CHICAGO

A great deal of skepticism concerning endocrine therapy of the adiposogenital dystrophies has arisen because of extravagant claims and ill defined indications. This has led to the treatment of patients who did not present true endocrinopathies¹ and the use of endocrine products which are now known to be ineffective.²

Many children with small genitalia are unjustly labeled "pituitary type," Fröhlich's syndrome or adiposogenital dystrophy. We must not overlook the fact that the most common cause of obesity is overeating.³ We must realize that pronounced obesity in itself may conceal the actual size of the genitalia so that a false impression may result unless careful examination is carried out. We must also consider the limits of normal; that small genitalia in the prepuberal period may signify simply a physiologic retardation or delay in development, possibly at the expense of rapid growth (which is common in many of these children), a retardation that may undergo spontaneous correction.

What then is adiposogenital dystrophy? Babinski⁴ and Fröhlich over forty years ago described cases of obesity⁵ with hypogenitalism secondary to expanding lesions in the region of the pituitary body. A few years later Bartel applied the term adiposogenital dystrophy to this syndrome but other investigators were not convinced that the destruction of the pituitary alone was responsible for this condition.⁶ In the past twenty years a great deal of experimental evidence has indicated that the pituitary and the region of the hypothalamus are concerned with growth, sexual development, certain phases of metabolism and obesity, although the exact relationship of these structures to obesity is not clearly understood. In all probability adiposogenital dystrophy is a dysfunction of the pituitary gland involving both the anterior and the posterior lobes, originating in the pituitary, the adjacent hypothalamic region or both. Bauer⁶ argues against the impairment of certain hypothalamic centers or of the pituitary and believes that "the frequent finding of small or incompletely descended testis can be explained by the underlying abnormal genetic factor which causes obesity and which affects the endocrine glands in general and the gonads in particular." Could not the abnormal genetic factors be responsible for the endocrine disturbance? Although in Fröhlich's original patient pituitary tumor was present, intracranial hemorrhage, encephalitis, possibly toxic suppression or degeneration of the pituitary or adjacent structures following infectious diseases of childhood may result in this clinical syndrome. There are many instances in which no pathologic lesion was demonstrable clinically or at autopsy, and it has been my experience that the majority of cases are in this group. From a clinical point of view, children who show definite evidence of endocrine

dysfunction, that is, hypogenitalism associated with pronounced obesity which cannot be explained on the basis of overeating in a broad sense, may be considered as presenting adiposogenital dystrophy.

Adiposogenital dystrophy occurs more often in females than in males, but the latter are seen more frequently because genital infantilism is more conspicuous. The onset may occur at any age. Rarely there is a history of excessive weight at birth. Often there is a rather sudden and progressive increase in weight, beginning between the ages of 7 and 10 years, which is out of proportion to the food intake. The clinical picture of typical so-called Fröhlich's syndrome or adiposogenital dystrophy is familiar to all and does not need elucidation.

These patients are usually endowed with normal intelligence and may be indolent and good natured. Not infrequently they are introspective because of self consciousness.

There may be an increased carbohydrate tolerance due to decrease in the secretion of an insulin-antagonizing hormone.⁷ Schwarz, Neuman and Baum⁸ found a high concentration of fat metabolism hormone in their cases. The basal metabolic rate is variable. There may be fluid retention or the other extreme, diabetes insipidus, due to disturbed water and salt metabolism. There may be an elevation of blood chlorides and uric acid and a diminution of specific dynamic action of proteins.

Roentgenograms of the skull usually reveal no abnormal changes. Occasionally enlargement and erosion of the sella indicative of an expanding lesion, calcification within the sella, or a sella considerably smaller than normal may be present.

DIAGNOSIS

The diagnosis of adiposogenital dystrophy must be made with caution. Many patients do not present the typical picture described, and it is difficult to interpret borderline cases. A consideration of the developmental history is important in regard to disturbance of somatic as well as mental development.

The genitalia of the male patient should be examined in the recumbent as well as in the upright position, so that excessive adipose tissue may be retracted and migratory testes manipulated in the scrotum and their size estimated. Rectal examination is important. In the older male the prostate and seminal vesicles, and in the female the pelvic organs may be infantile. Hormone assay of the urine may suggest an endocrine disturbance. In primary hypogonadism there may be diminished excretion of either androgens or estrogens with an increased excretion of gonadotropic substance, whereas in primary pituitary deficiencies there may be a diminished excretion of both.

TREATMENT

The treatment of adiposogenital dystrophy depends on the age of the patient and the presence or absence of organic disease.

The aim of endocrine therapy is restoration of function by stimulation or replacement. In treating the prepuberal patient several factors must be taken into consideration. Stimulation is desired and untoward effects are to be avoided. Excessive hormone may suppress the pituitary and also cause atrophy of the gonads

Read in the Panel Discussion on Endocrine Disorders of Adolescence before the Section on Pediatrics at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

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as the result of direct action.⁹ Less frequently precocious development¹⁰ with premature cessation of growth may occur. Because of these dangers both estrogenic and androgenic hormones should be avoided in the *prepuberal period*. Stimulation of the gonads by the combined administration of anterior pituitary extract and either chorionic or equine gonadotropin should be attempted. The former may supply a gonad stimulating fraction not present in either of the latter. In view of the metabolic disturbance present in these patients, I believe that anterior lobe extract containing not only the gonad stimulating but possibly the metabolic fraction is preferable. If there is an associated diabetes insipidus, posterior lobe extract (pitressin) may be administered.

For the puberal patient when it is desirable for cosmetic and psychologic as well as physical reasons to produce a more rapid appearance or improvement in the secondary sex characteristics, androgenic or estrogenic substance should be combined with the gonad stimulating preparations, the latter also possibly offsetting any local degenerative effect that the androgens or estrogens might have on the gonads.

In the castrate, whether surgical, cryptorchid or congenital, gonad stimulating hormones are of no value and it may be necessary to administer androgenic or estrogenic substances in large doses indefinitely.

The mode of administration and duration of treatment depend on the age of the patient and the response. In the prepuberal male or female the treatment may be a matter of weeks or months before either subjective or objective improvement results. Treatment should be interrupted at various intervals as refractoriness may develop.

In the rare case of intracranial tumor or cyst involving the pituitary, roentgen therapy or surgical intervention may offer some hope of improvement.

Dietary management and correction of faulty eating habits are essential in all obese patients regardless of the etiology.¹¹ A high protein, low caloric diet should be prescribed.¹² If there is evidence of water retention, sodium chloride should be restricted and potassium chloride or acetate substituted (the latter also having a diuretic effect). I have found that amphetamine sulfate is a valuable aid in controlling the abnormal appetite of many of these patients.¹¹ It has been my experience that, unless there is definite evidence of hypothyroidism, thyroid is of little value and may even be harmful. Also it frequently stimulates the appetite.

CONCLUSION

It should be repeated that not all obese children outgrow their fatness and not all children with hypogonadism improve spontaneously. If one reviews the case reports of adult hypogonadism, frequently one finds that the disturbance dates back to childhood. If the history is considered, if a careful physical examination is performed and if the laboratory results are properly evaluated, I do not believe that obese but otherwise normal children will be subjected to unnecessary endocrine therapy.

104 South Michigan Avenue.

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HYPOTHYROIDISM IN CHILDHOOD

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LOS ANGELES

For purposes of clarity, let us assume that there are three types of hypothyroidism during childhood, namely cretinism, juvenile myxedema and borderline hypothyroidism. As a matter of fact they are all one and the same disorder modified according to (a) the severity and (b) the length of time during which the patient has been subjected to the deficiency. Because we are dealing with a hormone whose purpose it is not only to develop the organism during the most plastic period of its existence but also to maintain it in functional equilibrium, one can readily appreciate the diagnostic variables to be encountered in a disruption of such a mechanism at any age.

Let us first consider the degree of severity. Until recently the more conservative observers were unwilling to concede any form of hypothyroidism which could not easily be classified under cretinism or myxedema. When analyzed closely, such a stand is not tenable. In common with most other secreting organs there is a margin of safety between the physiologic requirement of the thyroid and its functional capacity, but there is a threshold below which the gland may be said to be embarrassed rather than actually devoid of function. Such a mild disturbance encountered at any age but more commonly in early adolescence cannot be classified under cretinism and rarely develops myxedema.

The element of time is of equal importance. A mild degree of hypothyroidism for a short period, at any stage of development, will likely not be reflected objectively in the somatic or mental makeup. Over a period of years, however, even a mild degree of thyroid deficiency must leave its mark on both the soma and the psyche. A severe degree of deficiency, as that which follows total ablation of the gland (but which also occurs spontaneously), may completely incapacitate the patient within a few months, while partial or moderate deficiencies may go unrecognized for years. Thus the frequent confusion regarding the early diagnosis of other than the most severe case.

Classic hypothyroidism or cretinism and juvenile myxedema have been described for so many years by so many observers, without any new or startling innovations, that I shall refrain from going into detail in a consideration of this type of case. Suffice it to say that the classic hypothyroid child is still the dwarfed, lethargic, edematous, pot bellied, alabaster skinned, constipated imbecile it has always been. But we must keep this picture in mind since the study of disease entities begins with the classic case and hypothyroidism is no exception. Most observers are now agreed on the consistency with which certain laboratory and roentgen data are discovered in such classic cases.

BASAL METABOLIC RATE

Either in a closed chamber or by the open method, when estimated under ideal conditions (usually impossible) by any method of calculation, the oxygen consumption will be found to be much lower than in a similar group of normal children. In other words, the basal metabolic rate will be found to range between minus 20 and minus 40 per cent.

Read in the Panel Discussion on Endocrine Disorders of Adolescence before the Section on Pediatrics at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

BONE AGE

Every child with severe untreated hypothyroidism will show retardation of osseous development when the disorder has existed for a period long enough to be reflected in the somatic makeup.

BLOOD SERUM CHOLESTEROL

Most, if not all, observers in recent years have demonstrated blood serum cholesterol values ranging from 50 to 200 per cent above the average normal. Individual variations and different methods of determination make it difficult to arrive at actual figures. In my practice the abnormal values usually range from 250 to 500 mg. per hundred cubic centimeters.

URINARY EXCRETION OF CREATINE

Children with severe hypothyroidism, untreated, excrete considerably less creatine in the urine than a similar group of normal children.

THE MILD (OR BORDERLINE) CASE

If this is all true and, generally speaking, it is, although there are some exceptions, why would it not be easy to make diagnoses in mild or borderline cases by a mere modification of the foregoing? The basal metabolic rate is both mechanically and mathematically difficult to obtain in the average child, particularly the mentally inapt child. Children, technicians, machines and methods of calculation vary and so, unfortunately but inevitably, do results. It is therefore not a practical diagnostic procedure in the young child. In older, more tractable, children and in adolescence it is a part of the diagnostic procedure. Even here, too much dogmatism is employed in an interpretation of the findings. I have seen numerous children with very low readings who I am convinced did not suffer from hypothyroidism. I have seen children with normal or moderately high readings who have profited by thyroid administration. Never make a diagnosis or guide your dosage for any length of time by an estimation of the basal metabolic rate alone. Some individuals are veritable thyroid eaters and may take many times the normal physiologic dose without objective alteration of the metabolic processes. Others appear most sensitive to thyroid administration. It has been my experience that children who really need thyroid are more sensitive to it than the normal, particularly in the early weeks of treatment.

Bone age continues to be the most objective evidence of the developmental status of the child; but, while children with true hypothyroidism of long standing will have retarded osseous development, the reverse is not necessarily true. In my original paper on this subject some ten years ago and repeatedly since, I have advised that the interpretation of such a finding should be subjected to the same criticism as any other diagnostic procedure. It has been my misfortune, however, to see as much diagnostic dogmatism placed on shades of variation from the average normal in this subject as in the case of the basal rate. It may be employed safely as follows: If the child is retarded two years or more according to some accepted standard (and all of the standards are within a few months of one another), try to prove or disprove hypothyroidism in the patient by every other means. Do not use the wrist or any other roentgenogram as the sole diagnostic criterion. On the other hand, even severely hypothyroid patients will have no reflection of their difficulty in the osseous

development unless the condition has been present for a number of years. So it is even possible for a child with severe but recent hypothyroidism to have a normal bone age.

The blood serum cholesterol is not pathognomonic of mild or borderline hypothyroidism because values vary even in the classic case. When all other causes of high blood cholesterol have been ruled out, values have been found to vary in a large group of normal children. Persistent high blood cholesterol values otherwise unaccounted for (in my practice over 220 mg. per hundred cubic centimeters) are very suggestive, however, particularly if corroborated by other physical or laboratory criteria.

I have estimated the urinary creatine excretion in over a thousand children and still rest on my original findings. The creatine excretion is very low or absent in the classic hypothyroid child. But it is also low or absent occasionally in children who are dwarfed or puny but who otherwise do not fit into the classic hypothyroid group. Therefore, just as the bone age and the cholesterol, the creatine excretion is informative but not diagnostic.

Variations from the classic clinical picture are important diagnostic criteria. There may be something in the history, the appearance of the skin, the temperature, the pulse, the hair, the stature, the posture, the teeth or the voice to initiate the investigation. Overweight is a very poor diagnostic sign.

Finally we come to the therapeutic response. Classic hypothyroid children, with few exceptions, respond promptly to ingested thyroid. The oxygen consumption increases, the basal metabolic rate rises, the bone age in relation to chronological age increases, the blood serum cholesterol falls, the urinary excretion of creatine increases, the patient's height increment is enhanced, the infantile characteristics disappear and cerebration improves. But what of the mild or borderline case? Here as well the symptoms subside, but mere subjective improvement is not enough to satisfy the astute observer. For this reason every attempt should be made to arrive at some conclusion before beginning treatment. Too many children with developmental anomalies, birth injuries, mongolism and wholly unallied disorders, to say nothing of constitutionally inadequate children, are put carelessly on thyroid without an adequate investigation.

Amelioration of symptoms and alteration of laboratory and roentgen data are therefore diagnostic criteria of major importance. But even here we have our diagnostic difficulties. Evans has shown that thyroid is ineffective when administered to hypophysectomized animals. This is probably why some dwarfs fulfilling most of the criteria of hypothyroidism do not respond to thyroid administration. Also Smith and others have shown that administration of an anterior pituitary fraction complements the action of thyroid at least so far as the growth process is concerned. For these reasons we need a potent pituitary fraction to enhance our therapeutic armamentarium in the treatment of complicated hypothyroidism. To my knowledge such a product is not on the market.

The dose of thyroid is another variable, but something between one-half and three grains (0.03 to 0.2 Gm.) a day has been an adequate range in my practice. It may be given in a single dose once a day. All reputable brands of desiccated thyroid are efficacious,

but the clinician should familiarize himself with one brand before prescribing thyroid indiscriminately. In my judgment, thyroid should be administered alone and not with other usually inert glandular material. Dosage should be regulated by repeated clinical observations and occasional laboratory tests.

CONCLUSION

The diagnosis of mild or moderate hypothyroidism consists of a series of tests, all of which are highly informative but none of which are conclusive. When considered with the history and physical picture, one is frequently able to arrive at a fairly definite conclusion. The objective therapeutic response to thyroid may be necessary to establish a diagnosis, although congenital absence or disease of certain elements of the anterior pituitary may nullify the effect of thyroid even in a hypothyroid child. Treatment of all forms of childhood hypothyroidism should be early, adequate and persistent. Complete rehabilitation is possible under ideal conditions.

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GYNECOLOGIC PROBLEMS OF ADOLESCENCE

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No sharp time limits can be fixed for the period of adolescence, which represents a transition phase between puberty and full maturity. The latter themselves are periods subject to no fixed chronological laws. The changes of puberty involve far more fundamental phenomena than the mere appearance of the first menstruation (menarche). Many of these phenomena are carried over into adolescence. As a matter of fact, the gynecologic and endocrine problems of adolescence are essentially those of puberty. Moreover, they are practically all of endocrine causation, emphasizing again, if it needs further emphasis at the present day, how fundamental a role endocrinology plays in modern gynecologic practice.

Important as are the endocrines in the anatomic and physiologic phenomena of adolescence, there is one other factor which can never be overlooked in the interpretation of functional disorders at this epoch. I refer to the psychologic element. Even in the minds of the public, the term "adolescent psychology" carries with it a distinctive connotation, as popularized, for example, in the penetrating literary delineations of Booth Tarkington. It indicates a period of romanticism and idealism, impressionability, hero worship, day dreaming and other such traits. This transient phase, amusing as it may be to the child's elders, can never be overlooked as a possible influencing factor of adolescent functional disorders. As a matter of fact, it may lead to consequences which in the occasional case are not only not amusing but may actually be tragic.

If, for example, the girl's hero worship is centered on a distant movie star, the infatuation is certainly more amusing than harmful. But if, in a lower stratum, a girl bestows her idolatry on the neighborhood bully,

a bitter price may be exacted by the object of her hero worship. The purely psychologic aspects of adolescence, which must envisage a consideration of the newly awakened force of sex consciousness, will be considered by others in this symposium, but they frequently obtrude themselves into the interpretation of the functional gynecologic problems of adolescence.

From a purely physiologic point of view the period of adolescence may be brief or virtually nonexistent, as in many girls menstruation and ovulation may be normal in character and rhythm from the beginning. The anatomic changes, on the other hand, are always gradual. In some girls the appearance of the first menstrual period is preceded for many months by increasing development of the breasts, genital and axillary hair growth, rounding of the figure and other secondary sex manifestations. In others this preliminary phase is brief, the general developmental changes occurring chiefly after rather than before the menarche itself.

ABNORMALITIES IN HEIGHT

During adolescence there is an increasing restraint on pituitary growth hormone activity as a result of the increasing activity of the ovarian hormones. Various abnormalities in this hypophysiogonadal balance may bring about excessive or deficient skeletal growth, with varying degrees of gigantism or dwarfism. Aside from their purely objective aspects, such abnormalities often have profound psychologic repercussions, with the development of complexes characterized by morbid self consciousness concerning the affliction. Psychotherapy must often play an important part in the management of these conditions. The unusually tall girl, moreover, is prone to develop postural difficulties because of her tendency to stoop to make herself seem shorter. These postural difficulties are often later expressed in back-ache, lower abdominal discomfort, and even in the form of dysmenorrhea.

DYSMENORRHEA

The role of the psyche in the production of primary dysmenorrhea is unquestionably a most important one, although only a minority of gynecologists accept the view that all cases of this disorder are of psychogenic etiology. The best prophylactic against this type of dysmenorrhea is proper training of the girl, preferably by her mother, as to what menstruation signifies and what it does not signify and, above all, that the function is not characteristically associated with pain and that it should interfere but little with the life activities of the girl. Unfortunately this ideal training is not available to most young girls in the puberal and adolescent years. Many mothers are loath to discuss these problems with their daughters and only too often are themselves ignorant of simple facts about the menstrual function. If any advice is given, it is far more apt to consist of admonitions tending to make the girl coddle herself during menstruation. Thus the impressionable youngster is apt to look on menstruation as a time when she should actually be unwell, and a step is taken toward the development of primary dysmenorrhea. Various forms of psychic trauma to which the adolescent girl is so often exposed may accelerate her progress toward dysmenorrhea.

Almost as important, perhaps, is the constitutional factor, as expressed in the general health level of the girl, and her habits as to exercise, recreation, study, food and sleeping hours. The foundation of many cases

not only of dysmenorrhea but also of general neuroticism and invalidism is laid in adolescence. The young girl who is so ambitious to excel in her scholastic work that she neglects recreation, sunshine and proper sleep in this developing epoch of her life often pays the penalty later on as a menstrual invalid of one type or another.

These statements may seem trite and old fashioned now that the endocrine explanation of primary dysmenorrhea occupies the limelight of discussion. The mechanism of primary dysmenorrhea, however, is still a mystery in spite of the fact that studies of the effects of the ovarian hormones on the uterine musculature have appeared to have a close bearing on the problem. By all but a few dissenters estrogen is accepted as the normal stimulant of uterine contractility, while progesterone is the normal inhibitor. If, as seems likely, the pain of dysmenorrhea is the result of exaggerated painful contractions of the uterine musculature, the natural suggestion would be that dysmenorrhea is brought about by a relative excess of the estrogen effect or a deficiency of progesterone. The factor of sensitivity of the individual uterine musculature to these hormones must also be considered, though there is no way to evaluate this clinically.

The hormone treatment now so popular in dysmenorrhea is based on the aforesaid premises. It consists in the employment of substances which, so far as the uterine muscle is concerned, are supposedly antiestrogenic in their effect (preparations of testosterone) or of preparations which, from the same point of view, are synergistic with progesterone (preparations of progesterone, testosterone and chorionic hormone). Few gynecologists are altogether satisfied with the results of such therapy in spite of the fact that it appears to be of genuine value in many cases. It cannot be too strongly emphasized that dependence on endocrine treatment alone, with disregard of psychic and constitutional measures, is certainly not justified in the present state of our knowledge and is quite sure to result in a large proportion of failures.

Many years ago, when the roles of estrogen and progesterone were first being discussed, I called attention to two features of primary dysmenorrhea which seemed paradoxical. One of these is the fact that in certain conditions in which there is a relative and perhaps decided excess of estrogen and perhaps a complete absence of progesterone, and in which one might therefore expect an exaggerated contractility of the uterus, pain is characteristically absent. This is conspicuously the condition of affairs in most cases of functional bleeding.

The second puzzling feature was the fact that, in a considerable proportion of cases, primary dysmenorrhea does not begin at the menarche but a considerable time, from a few months to several years, after the first menstruation.

Can we reconcile these facts with the present day endocrine theory of dysmenorrhea? In the largest group of cases of functional bleeding ovulation does not occur, and more recently we have learned that ovulation may remain in abeyance for a considerable time after the inauguration of menstruation. Thus it appears that primary dysmenorrhea is a disease of ovulating women and that the anovulatory cycle, prone though it is to exhibit aberrations characterized by excessive bleeding, is not associated with pain. The correctness of this assumption has been established by

Sturgis and Albright¹ by means of endometrial studies, although others like Wilson and Kurzrok² had previously expressed this view. Sturgis and Albright were able to prevent primary dysmenorrhea for a particular cycle by inhibiting ovulation with large doses of estrogen in the early part of the cycle. Their good results have been repeated by others, though not with such invariable success.

These advances have not solved the riddle of dysmenorrhea either as to its mechanism or as to its treatment. They have, however, emphasized the real importance of the endocrine factor. By means of large doses of estrogen begun early in the cycle it appears possible to inhibit ovulation and to make the next period painless, but repetition of the treatment, aside from other obvious disadvantages, is often unsuccessful. Conceding that primary dysmenorrhea is characteristically a disease of ovulating women, we are still in the dark as to its underlying cause. Various hypotheses have been suggested, such as that of imbalance between the two ovarian hormones, with perhaps resulting abnormalities in the partition of the estrogenic principles, but nothing of a definite nature has been established, so that we shall have to struggle with this common and distressing problem of dysmenorrhea for some time to come.

AMENORRHEA

This is not the place to attempt a complete discussion of the possible causes of amenorrhea in adolescence. Here we most commonly have to deal with the primary type, but the secondary variety is not rare in girls still within the adolescent phase. From a practical point of view the chief admonition would be not to resort too quickly to ovarian or gonadotropic therapy in young girls. The first menstruation not infrequently does not appear until the age of 16, and even the age of 17 is not exceedingly rare for the menarche. In my own work endocrine therapy is rarely resorted to before the age of 17, except perhaps for the employment of small doses of thyroid. This does not mean that other measures, such as those directed toward raising the constitutional health level in every possible way, are to be neglected, for this would be most unwise. Nor does it mean that an obvious or demonstrable endocrinopathy, such as hypothyroidism or dyspituitarism, should not be studied and treated according to accepted methods.

The fact remains, however, that a great many girls of 15 or 16 are unnecessarily subjected to "shots" of all sorts, that such treatment in itself is generally ineffective, and that when menstruation does occur following such treatment it would probably have occurred without it. Every conservative gynecologist is pessimistic about the organotherapy of endocrinopathic amenorrhea in general, and too early and unnecessary resort to such treatment in young girls may engender undesirable psychologic sequelae. In the treatment of all menstrual difficulties in adolescent girls, the physician can perform an incalculable service by reassuring explanations not only to the patient but to the mother as well, since the latter so often has wrong ideas as to the possible dangers of amenorrhea in itself. Especially important is it to stress the fact that the mere absence of menstruation is in itself harmless, for on this point many wrong ideas are still prevalent.

1. Sturgis, S. H., and Albright, Fuller: Mechanism of Estrin Therapy in Relief of Dysmenorrhea, *Endocrinology* 26: 68-72 (Jan.) 1940.
2. Wilson, Leo, and Kurzrok, Raphael: Studies on Motility of Human Uterus in Vivo, *Endocrinology* 23: 79-86 (July) 1938.

FUNCTIONAL BLEEDING

Excessive menstrual bleeding is a frequent occurrence in young girls, and with few exceptions it is of functional nature. The diagnostic problem is far simpler at this age epoch than it is in the case of abnormal bleeding near the other extreme of menstrual life, when so many other possible factors, some of serious import to the patient, must be considered. Simple rectal examination will usually, in the case of young girls, eliminate the relatively rare neoplastic lesions which might at times cause excessive menstruation. While this should be done, few mistakes will be made if the functional nature of the bleeding is taken for granted.

The common mechanism of adolescent functional bleeding consists, in brief, in a failure of ovulation, with resulting excess of the estrogenic hormone and an absence of progesterone. In other words, it represents an exaggeration of what happens in the anovulatory type of cycle so often seen in the early years of menstrual life. The fact, for example, that a girl begins to menstruate at 14 does not necessarily mean that she is susceptible of fertilization if insemination should occur, for she may not begin to produce eggs for a considerable time after the menarche. That the anovulatory type of cycle of which functional bleeding is so often an aberration is not infrequent in the early months or even years of menstrual life has been well established, but there are no available data as to its relative incidence as compared to the common ovulatory cycle.

The disorder therefore revolves around the failure of ovulation, of whose hormone causes we still know little, but there is little doubt that the underlying disturbance is in the anterior hypophyseal lobe. No very effective method of inducing ovulation in the nonovulating human female is as yet available in spite of the enthusiastic reports of some writers as to the efficacy of the equine gonadotropic preparations (pregnant mare serum). The immediate purpose of most methods of treatment is to limit the abnormal bleeding rather than to induce ovulation, and for this purpose three chief types of hormonal preparations have been employed: progesterone, testosterone and the chorionic hormones found in pregnancy urine. In general the results must be evaluated as far from satisfactory but in a considerable proportion of cases sufficiently effective to tide the girl over her frequently temporary phase of excessive bleeding.

The tendency in most cases of functional bleeding seen in adolescence is toward readjustment of the endocrine balance with then the occurrence of ovulation and the establishment of essentially normal bleeding. For this reason it is a wise policy to abstain from endocrine therapy in the frequently observed cases of mild degree in which the blood loss is so moderate as to produce no demonstrable degree of anemia. Unfortunately, more active measures are often made necessary by the profuse and even exsanguinating bleeding which may occur. Curettage may be indicated for the immediate control of the bleeding, temporary though this relief may be, while hematinic measures and sometimes transfusion are not infrequently called for. More radical measures, such as hysterectomy or radiotherapy, are rarely to be thought of, although many excellent gynecologists resort to small doses of radiotherapy in the more severe cases. In general, however, radiologists agree with gynecologists that radiotherapy should be a method of last resort, as even very light dosage may produce permanent effects in the occasional case.

OBESITY

The problem of the fat girl is a common one in gynecologic practice, especially since so many of this group of patients suffer also from amenorrhea or other menstrual abnormalities. The management of the amenorrhea cannot be separated from that of the obesity. This is not to say that they are invariably associated, for this is the case in only a proportion of the patients. As with obesity in general, the milder forms may be of exogenous causation, with overeating as the most important factor. In the majority of patients who are brought for medical advice, however, endocrine factors of one sort or another are concerned.

Careful study will often permit of classification on a reasonably sound basis. In the majority of instances of pronounced obesity the cause will be designated as pituitary, hypothalamic or a combination of the two factors (hypophysiohypothalamic). It is in the latter two groups that we must place most of the extreme cases, as when girls of 16 and 17 reach a weight of 200 pounds or more. In obesity of this extreme grade, menstruation may be entirely normal, scanty, irregular or absent altogether, indicating presumably the degree of participation of the pituitary sex hormones.

The fact that both menstruation and ovulation may be entirely normal, that disturbances of fluid balance are not infrequently present, that obesity of this type may occur with tumors in the parapituitary region and as a sequel of encephalitis or basal meningitis—all these point circumstantially to the fact, for which there is also experimental evidence, that the seat of trouble is in certain parapituitary areas of the midbrain, probably in the hypothalamic region. For such types of obesity there is no direct endocrine treatment, but efforts may be made, usually unsuccessfully, to treat the amenorrhea. Aside from this the employment of such measures as low caloric diet, exercise, massage and perhaps the cautious employment of thyroid would seem to represent our whole armamentarium.

In the more moderate grades of obesity, we have often to do with pituitary, thyroid or ovarian factors. This is not the place to elaborate on the available methods of study and management of such cases. One point seems to me well worth stressing. Puberty, like the menopause, represents a phase at which there occurs a readjustment of the endocrines. As a result of this reshuffle, many a girl who has been obese before puberty assumes essentially normal proportions afterward, and menstruation may be established normally. On the other hand, puberty may bring about an accentuation of a preexisting endocrinopathy with persisting and increasing obesity and often amenorrhea.

The moral is that we should be slow to resort to endocrine therapy in prepuberal or puberal patients, and that treatment should be restricted to such limitation of diet as the active life of a young girl will justify, together with exercise. The cautious employment of thyroid, especially when there is evidence of hypothyroidism, is indicated in some cases.

The morbid self consciousness of many fat girls concerning their affliction must be combated with reassuring psychotherapy, and especial care should be taken to warn against the extreme and inadequate dieting to which many youngsters subject themselves in their desperate efforts to reduce. Aside from other dangers, the ovaries are extremely sensitive to nutritional and vitamin deprivation, and this in itself may be a cause of amenorrhea, as I have observed in a good many cases.

HIRSUTISM

While not as common as some other adolescent disorders, there are few afflictions which can be the cause of more mental distress than hirsutism, especially when it involves the face. The adrenal cortex and the pituitary appear to be incriminated in most of these cases, but no effective endocrine treatment is as yet available. In the frequent mild form involving the upper lip alone, relief may be obtained by the painful, time consuming and expensive method of electrolysis, while in other cases depilatory and other cosmetic technic is available. In the extreme grades frequent close shaving may be necessary.

Hirsutism may be noted in girls who otherwise are typically feminine, with normal menstruation and ovulation, well formed breasts and normal genitalia. In itself it is not to be looked on as evidence of a masculinization tendency, as so many of these sufferers wrongly fear. It is only when combined with other intersexual manifestations, such as hypertrophy of the clitoris, flat breasts and a deep voice, that it is to be looked on as a part of a masculinization syndrome.

BREAST ABNORMALITIES

Unusually flat breasts in otherwise normally developed girls are the source of frequent unhappiness, as is the opposite condition, in which the breasts are of unusually large or even enormous size. The fact that both of these two conditions are so often noted in otherwise normal girls, with normal menstruation, points to the fact that the causative factor is not an abnormal deficiency or excess of the ovarian hormones on which breast development depends. Rather does it indicate that the breast tissues of the particular girl are for some reason unduly refractory or abnormally sensitive to the estrogenic growth stimulus.

While the flat breasted girl is often treated with some form of estrogen administration, either hypodermic or percutaneous, the results are not usually significant, and my experience has been that they are rarely better than can be obtained by such simple measures as frequent massage, designed to promote growth by increasing the blood supply.

Nor is there any satisfactory endocrine therapy for the abnormal hypertrophy occasionally seen as a local exaggeration of the puberal secondary sex phenomena. When not too pronounced, the problem can be reasonably well taken care of by some form of breast uplift. In the extreme forms, in which the breasts may hang to or beyond the waist, plastic operations may be necessary, but these require special skill and experience to secure satisfactory results.

SUMMARY

There are few disorders, developmental or functional, which are distinctive of the period of adolescence, but the rather special psychology of the adolescent girl gives these disorders an added importance at this phase of life, and the type of management may influence greatly the later life of such patients. Among the major problems discussed are the menstrual disorders, but others frequently encountered, and briefly considered in this paper, are abnormalities of body growth, obesity, abnormalities in breast development and hirsutism. A reshuffle of the endocrines takes place at the puberal epoch, and conservatism must be the guiding motif in endocrine therapy at this phase of life and also in adolescence.

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ENDOCRINE TREATMENT OF
CRYPTORCHISM

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In 1939 we¹ reported on the status of glandular therapy in patients with undescended testes and compared our results with those reported in the literature. In contrast to the 61 per cent of successful results of other observers we were able to produce descent in only 20 per cent of our cases and in only 27 per cent of those occurring in patients under 16 years of age. We were not able to produce descent in any instance in which the testis was intra-abdominal, although a high incidence of successful results (55 per cent) had been reported in patients with testes of this type. We concluded that glandular therapy would produce descent only in those testes which would descend by the time of puberty without treatment; namely, those which were not retained by mechanical factors. Nevertheless the treatment appeared valuable because it made it possible to determine at an early age whether operative procedures would be necessary or not in order to get the testis into its normal environment. Our investigation of this problem has continued and new patients have been observed. Several of the patients previously reported on have undergone orchiopexy. We may therefore check the accuracy of our previous conclusions and make any additions that may be warranted by further experience.

DATA

We have observed the effect of treatment in 89 undescended testes in 67 patients varying in age from 10 months to 37 years. Fifty-two patients were under 16 years of age. In 25 patients the condition was originally bilateral, but in 3 of these the position of one of the testes had been corrected by orchiopexy before the patient reported to us. Fifty-three of the patients showed normal body contour, 8 patients were of the Fröhlich type and 6 patients were eunuchoid. Eunuchoidism did not become evident until the time of puberty. The secretion of sex hormone at this time apparently exerts an important influence on the growth of the epiphyseal centers in the vertebrae as well as in the long bones, thus affecting the relation between the length of the trunk and the length of the extremities. Of 9 patients over 16 years of age with bilateral cryptorchism, 6 patients were eunuchoid in type while the remainder showed normal development of the penis, musculature and skeleton. All of them, however, showed some evidence of sex hormone deficiency.

Preparations Used.—This study is limited to our experience with chorionic gonadotropin. We used the products of four manufacturers.² Several patients who were treated with other types of glandular products or by surgery alone are not included here; neither are patients with migratory testes.

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Read in the Panel Discussion on Endocrine Disorders of Adolescence before the Section on Pediatrics at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Thompson, W. O., and Heckel, N. J.: Undescended Testes, Present Status of Glandular Therapy, *J. A. M. A.* **112**: 397 (Feb. 4) 1939.

2. A. P. L. of Ayerst, McKenna and Harrison, Follutein of E. R. Squibb and Sons, Korotrin of Winthrop Chemical Company and Franturon of the Schering Corporation.

RESULTS

Our proportion of successful results has remained about the same, namely 24 per cent for the total number of undescended testes and 27 per cent for the total number of patients. Since the response bears some relation to the age of the patient and the location of the testis before treatment, our results may be discussed under these headings.

Relation Between Age and Response.—A higher percentage of successful results was noted before than after the age of puberty (table 1). Thus, in 34 patients 10 years of age and under, descent occurred in 14 of 44 undescended testes (32 per cent) while in 15 patients 16 years of age and over, descent was observed in only 4 of 24 undescended testes (17 per cent). The difference is not so great if the patients 11 to 15 years of age are included in the younger group. The higher incidence of descent before puberty may be readily explained. At the age of puberty hormonal factors normally come into play which cause descent of all those testes not retained by mechanical factors. As a result, the incidence of undescended testes in untreated patients is less after the age of puberty, and the only patients in whom any response to chorionic gonadotropin might be expected after this age would be those with hypopituitarism and associated hypogonadism.

TABLE 1.—*Relation Between Age of Patient and Response to Treatment with Chorionic Gonadotropin*

Age, Years	Number of Patients	Number of Patients Showing Descent of Testis	Number of Undescended Testes	Number of Testes Showing Descent
0-5.....	8	2	12	2
6-10.....	26	10	32	12
11-15.....	18	3	21	3
16 and over.....	15	3	24	4
Totals.....	67	18	89	21

Only 3 of our patients showed descent after the age of puberty, and all of them were eunuchoid men 23, 25 and 33 years old respectively. In the 23 year old patient 1 testis descended from about the midcanal, and in the 25 and 33 year old patients 1 descended from the abdomen and 2 from a position over the external oblique. Descent of the testes in these instances was associated with genital growth. In other words, by administering chorionic gonadotropin we had supplied artificial stimulation to the testes which normally comes into play spontaneously at the time of puberty. When cryptorchism in men is associated with primary hypogonadism, descent of the testis may sometimes be produced with testosterone propionate.

Relation Between Position and Response.—In table 2 it may be seen that there is a definite relation between the position of the testis and the response to glandular therapy. Our highest percentage of successful results was noted when the testis was in the canal or between the lower end of the canal and the upper end of the scrotum (36 per cent). Up to the present time we have been able to produce descent in only 2 of 34 intra-abdominal testes with chorionic gonadotropin (6 per cent) in spite of the fact that reports in the literature indicate descent in 55 per cent of such cases on the average. Testes deflected in abnormal positions have responded fairly well to treatment. Thus 35 per cent of those deflected over the external oblique have descended as did 1 of 4 that were directed toward the perineum. In this respect our results differ from those

which we have previously reported.¹ Perhaps in some instances a testis which was outside the canal could be deflected so easily over the external oblique that we erroneously concluded that this was its position. Several factors may be involved in the relationship between anatomic position and response to glandular therapy. When the testis remains in the abdominal cavity for a considerable length of time it may be damaged and incapable of showing much response to treatment. In occasional instances we have been unable to find any testis within the abdominal cavity at operation. Testes deflected in abnormal positions might be expected to progress farther in their abnormal direction following treatment, but this is certainly not always the case.

It follows from these observations that:

1. If the testis is in the canal or outside the canal, the results of glandular therapy are fairly satisfactory. Our data have not been analyzed to determine the relation between the position in the canal and the response to glandular therapy, but it is our impression that the lower the testis lies in the canal the better the response to treatment.
2. If the testis is in the abdominal cavity, it is unlikely that descent will occur with glandular therapy.

FINDINGS AT OPERATION IN UNSUCCESSFUL CASES

Twenty-five patients in whom the testes failed to descend with chorionic gonadotropin have undergone an orchiopexy. In 5 the operation was bilateral, making a total of 30 orchiopexies. As in our previous smaller series, anatomic factors were found which may have been related to the failure of descent. These included:

1. Fibrous bands which not only immobilized the testis but shortened the cord by producing adhesions to surrounding structures (all patients).
2. Abnormal direction of the peritoneal process (11 patients), which in 9 patients was turned upward over the external oblique, in 1 lay over the rectus sheath and in 1 was directed toward the perineum.
3. Absence of the external ring (1 patient).
4. Absence of testis (2 patients).

Until more precise information is available concerning the normal mechanism of descent it will be impossible for us to give a satisfactory explanation of our findings at operation in unsuccessful cases. In many instances the peritoneal process extended a considerable distance below the level of the testis, and it is of course well known that during normal development the peritoneal process precedes the testis into the scrotum. It is possible that fibrous bands may have prevented the descent of the testis along the peritoneal process. The abnormal deflection of the peritoneal process in many of the patients suggests that during embryonic development the scrotal fibers of the gubernaculum may have failed to appear. However, it is necessary to preserve an open mind on this problem because some testes that were deflected over the external oblique descended during the administration of chorionic gonadotropin.

PITFALLS IN DIAGNOSIS

There are two important diagnostic considerations:

1. The determination of whether or not the patient has true cryptorchism, and
2. The recognition of the accurate position of the testis.

It is important to exclude patients with pseudocryptorchism. (We have a separate series of 40 such patients.) This condition is present when the testis moves spontaneously or can be made to move between the scrotum and a higher level. These migratory testes

move permanently into the scrotum at the time of puberty and should not be included in a study of true cryptorchism. In some instances of pseudocryptorchism the testes may retract into the abdomen, simulating intra-abdominal cryptorchism. Since we used larger doses of chorionic gonadotropin than many observers, the only way we can account for our lower percentage of successful results is by difference in diagnostic criteria. In order to exclude migratory testes and determine the correct location of the testis, it is desirable to examine the patient in the upright position on at least two different days. Testes which lie over the external oblique are usually freely movable just under the skin. A hernial sac is not infrequently associated with failure of descent of the testis and usually extends below the testis. Occasionally the attention of the patient or the mother is directed to an undescended testis by the sudden development of a strangulated hernia.

CAUSES OF CRYPTORCHISM

The response to glandular therapy and the findings at operation suggest that there are two causes for cryptorchism:

- 1. A hormonal deficiency.
- 2. Anatomic abnormalities.

onic gonadotropin? There are several arguments in its favor:

- 1. The testis can function normally only in the environment of the scrotum.
- 2. It is therefore logical to assume that the earlier the testis is brought into the scrotum the more likely it is to be normal.
- 3. With glandular therapy it is possible to determine at an early age whether operative procedures are necessary or not. If there is no mechanical obstruction the testis will descend with glandular therapy alone (about one fourth of the cases).³ If it does not descend, operative procedures are necessary and are facilitated by the enlargement of the parts produced by glandular therapy. In spite of all the work done in the past twelve years on the treatment of undescended testes, the notion still persists in many quarters that the condition is of no consequence and will be outgrown. We are unable to subscribe to this point of view.

The chief argument against glandular therapy is that in order to produce descent it is usually necessary to produce some genital growth and it is possible that premature stimulation may adversely affect the function of the testis in later life and stimulate premature closure of the epiphyses. After following patients very carefully during the past seven years, our impression is that the treatment is beneficial instead of harmful when

TABLE 2.—Analysis of Our Results in Treatment of Undescended Testes with Chorionic Gonadotropin

Age, Years	No. of Patients	Total No. of Undescended Testes	Total No. Descended	Percentage Descended	Type				Location									
					Bilateral		Unilateral		Intra- Abdominal		Inguinal		Ectopic					
					No. Before Treatment		No. Before Treatment		No. Before Treatment		No. Before Treatment		Deflected Over External Oblique Muscle		Deflected Over Rectus Sheath		Deflected Toward Perineum	
					No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended	No. Descended		
10 mo. to 37 yr.	67	89	21	24	44	10	45	11	34	12	33	17	6	1	0			
10 mo. to 15 yr.	52	65	17	26	26	6	39	11	19	1	23	13	4	1	0			
16 to 37 years.	15	24	4	17	18	4	6	0	15	1	5	4	2	0	0			

The testis normally moves into the scrotum during the ninth month of fetal life. It appears that both hormonal and anatomic factors are involved. It has not been clearly established what these hormonal factors are in intra-uterine life. The presence of large quantities of chorionic gonadotropin in the urine of the pregnant mother and the production of descent with this material after birth suggest that it may play an important role in the descent of the testes in utero. When undescended testes move into the scrotum at the time of puberty without treatment, the stimulus appears to come from the anterior lobe of the pituitary. In descent of the testis it is necessary to consider not only hormonal factors but also the anatomic integrity of the parts involved. According to some observers the gubernaculum plays an important role. Thus absence of scrotal fibers and persistence and overdevelopment of other fibers such as those that are attached to the external oblique, base of the penis and the perineum may account for some abnormal deflections.

STATUS OF GLANDULAR THERAPY

We can see no reason to modify the conclusion previously reached; namely, that chorionic gonadotropin causes descent only of those testes which would descend at the time of puberty without treatment, i. e. those not retained by mechanical factors. Since this appears to be the case, what is the virtue of treatment with chori-

properly carried out. The majority of boys with undescended testes appear to be slightly frail, delicate and somewhat effeminate. With chorionic gonadotropin their appetite improves, their muscles become larger and firmer and they become more vigorous and masculine. However, chorionic gonadotropin is a very potent therapeutic agent and must be used carefully. Its chief danger as we see it is the production of excessive genital growth, which can be avoided if the patients are carefully followed during treatment. Growth of the genitalia stops as soon as the stimulus is withdrawn. The main problem now seems to be how early treatment should be started. Most of the patients that are referred to us are more than 3 years old and the thing that impresses us is that the undescended testes in these patients remain small after being brought into the scrotum either by glandular therapy or by operative procedures. Perhaps the testes were defective in the beginning and perhaps this was the reason for their failure to descend, but it is also possible that the testes were small because they had remained too long in their abnormal environment. Since the normal environment of the testis is the scrotum and since the testis normally moves into the scrotum during the ninth month of fetal life, it is possible that better results would be achieved if treatment was carried out at a much earlier age, perhaps shortly after birth.

3. If there is an associated hernia, operative procedures will be necessary in any case.

The effective dose of chorionic gonadotropin varies from 100 to 500 international units three to six times a week. In successful cases the testis usually descends within eight or nine weeks, although much longer periods of treatment are necessary in some instances. In order to determine whether or not the treatment will be effective, it usually must be continued until some genital growth has been produced. If operative procedures prove necessary, they should be carried out at once. If glandular therapy is discontinued for any length of time beforehand, regression in the size of the genitalia may increase the technical difficulties of the operation.

Pituitary and equine gonadotropin are not very suitable therapeutic agents, although theoretically desirable, because they contain both follicle stimulating and luteinizing factors, whereas chorionic gonadotropin contains principally luteinizing material. In actual practice the pituitary and equine gonadotropins available at present produce little stimulation of the male gonad.

Since chorionic gonadotropin produces its effect by stimulating the testis to produce male sex hormone, it might be considered desirable to administer male sex hormone itself in the treatment of undescended testes. However, this material damages the seminiferous tubules⁴ and should not be used unless both testes are incapable of responding to stimulation.

SUMMARY

The evidence available suggests that there are two causes for failure of descent of the testis:

- (a) A glandular deficiency.
- (b) Anatomic abnormalities.

Since the testis can function normally only in the environment of the scrotum, it is logical to assume that the earlier it is brought into the scrotum the more likely it is to be normal.

With glandular therapy it is possible to determine at an early age whether operative procedures are necessary or not. If there is no mechanical obstruction, the testis will descend with glandular therapy alone. If it does not descend, operative procedures are necessary and are facilitated by the enlargement of the parts produced by glandular therapy.

Chorionic gonadotropin is the most satisfactory therapeutic agent in most instances.

Treatment involves the intelligent combination of glandular therapy and surgical procedures.

The age of the patient and location of the testis have some bearing on the success of glandular therapy. The incidence of successful results is higher before than after the age of puberty.

We were able to produce descent in only 2 of 34 intra-abdominal testes. The majority of the successful results occurred in testes which were in the inguinal canal or outside the canal.

It is still uncertain how early treatment should be carried out, but our observations suggest at a very early age.

It is important to distinguish between true cryptorchism and pseudocryptorchism (migratory testis). Migratory testes descend spontaneously at the time of puberty and require no treatment. Their inclusion in studies of glandular therapy exaggerates the percentage of successful results.

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4. Heckel, N. J.: The Influence of Testosterone Propionate on Benign Prostatic Hypertrophy and Spermatogenesis: A Clinical and Pathological Study in the Human. *J. Urol.* 43: 286 (Feb.) 1940.

ABSTRACT OF DISCUSSION

ON PAPERS OF DR. KUNSTADTER, DR. SHELTON, DR. NOVAK AND DRS. THOMPSON AND HECKEL

DR. THEODORE O. ELTERICH, Pittsburgh: This symposium is important and timely. Faddists, charlatans and well meaning but inadequately informed physicians have beclouded the issue with exaggerated or contradictory statements. Endocrine preparations were injected into adolescent buttocks long before there was any attempt to study the normal anatomic and physiologic deviations of the onset of puberty and the varying characteristics of adolescence. It is a platitude to say that the United States is a racial melting pot, but in no phase of medicine is this statement of greater scientific significance. Certain race mature early. We expect an Italian or a Jewish girl to establish her menarche earlier than a girl of Scandinavian origin. But with the intermarrying of these innumerable races how can we know the limits of normal deviation in their offspring except in grossly abnormal situations? What is true of our lack of knowledge of normal deviations in maturity onset is also true of normal deviations in growth and other phenomena. I will say a few words about the growth abnormalities of puberty. It is not often that one has an identical twin as a control. Marcella and Marie were 13½ years old when I first saw them. Marcella, with a glioma of the optic chiasm, was 36 pounds (16 Kg.) less heavy and 11 inches (28 cm.) shorter than her identical twin, Marie. She had no evidence of secondary sex development. She showed many characteristics of hypothyroidism. Marie, the normal identical twin, had established her menarche and manifested the expected secondary sex characteristics. There are varying causes of precocious puberty. The following cases, which have been under my care for many years, illustrate three different types: Viola began to menstruate at 2 years. When she was first seen by me at 4 years she was in reality adolescent, with all the secondary sex characteristics of a girl of 14 years. Her condition is evidently due to hyperplasia of the basophilic cells of the anterior pituitary. She is now at nearly 15 years a dwarfed adult only 51½ (130 cm.) inches tall, with a pronounced disproportionate shortness of the lower extremities. Irma-Fred is a pseudohermaphrodite, a condition evidently caused by hyperplasia of adrenal cortical tissue. Besides the scrambling of his secondary sex characteristics he is a dwarfed adolescent only 55¾ inches (140 cm.) tall at 19 years. He was born with evidences of precocious puberty and secondary sex characteristics. Johanna illustrates a third type of precocious puberty—virilism. At 5 years she began to mature, but after a masculine fashion. This condition is also due to hyperplasia of adrenal cortical tissue.

DR. E. PERRY McCULLAGH, Cleveland: In commenting on adiposogenital dystrophies I wish to emphasize the importance of accurate diagnosis. We should no longer speak loosely of "pituitary cases" or consider all obesity in adolescence as Fröhlich's syndrome. In such cases the possibility of suprasellar cyst should be remembered and this possibility eliminated by roentgenograms and perimetric fields if indicated. In the fat child who is taller than normal a diagnosis of Fröhlich's syndrome should be considered doubtful, as the increased skeletal size argues strongly against hypopituitarism. Thyroid feeding of such children may cause abnormal increases in skeletal growth. Hypothyroidism is frequently assumed on the basis of obesity plus perhaps a coexisting hypometabolism. In both instances the assumption is usually unsound. Hypothyroidism may be concomitant in some cases but should be diagnosed on the basis of such criteria as those which Dr. Shelton has so accurately outlined for us. Assays of limited diagnostic value. If the diagnosis is doubtful for children during adolescence the finding of normal adult levels of androgens or estrogens in the urine may deter us from unnecessary treatment. Thyroid is of limited value in treating obesity. It is well to remember that the basal metabolic rate is not likely to be raised more than 10 or 15 per cent by the doses of thyroid which can be used, and, accordingly, the change in the caloric requirement is likely not to be greater than 150 or 200 calories a day. In my practice, I commonly use a diet based on the basal caloric requirement for the ideal weight, adding 10 per cent. I have used pituitary metabolic hormone in a few cases, but it

in which surgery is imperative from those in which it is contra-indicated?" One of my main theses has been that we have not recognized instances of hyperthyroidism other than those that occurred in cases of exophthalmic goiter. Furthermore, the use of the term "hyperthyroidism" in children is misleading. If they have hyperactivity it is due to exophthalmic goiter, but we can recognize as clinical evidence overactivity of the gland, such as one sees in older patients. I think that answers both parts of that question. The last question is "Do you imply that all children with so-called exophthalmic goiter have actual exophthalmos as determined by measurement by exophthalmometer?" I can state that exophthalmos sufficient to be measured by the instrument occurred in about 90 per cent of the cases. In about 10 per cent it was very slight and in a few instances not evident. Other symptoms complete the picture, and identification of the type of pathologic change in the thyroid gland established the diagnosis of exophthalmic goiter.

Dr. A. WILMOT JACOBSEN, Buffalo: I have a question: "Is there any evidence that Lorain and Brissaud dwarfism are due to endocrine dysfunction or hypofunction?" This question refers to the delicately built, normally proportioned dwarfs who are made sexually infantile, and this condition, theoretically, should be due to primary pituitary deficiency, and therefore I feel that they should be given a trial on appropriate endocrine therapy. The next one is "Is there any hormone or hormones for anti growth effect for those who grow too tall when height alone is excessive?" Several things have been suggested. One is irradiation of the pituitary to try to decrease the output of growth hormone, but the chance of damage to other important hormones of the pituitary is too great for such a course to be advocated. Another theoretical suggestion has been to try to close the epiphyses by giving an excess of the sex hormone and, as we have heard today, that does not seem to be a highly satisfactory way to treat this condition. It is a question whether it really does just that. I believe that at present we have no adequate way to treat these excessively tall children.

Dr. EMIL NOVAK, Baltimore: I have quite a sheaf of questions, but I think I can group them fairly satisfactorily. First, with reference to Dr. Turner's comment on prepubertal obesity, the traditional distinction between exogenous and endogenous factors is still a useful one. Many children, like many adults, are fat because they overeat and do not exercise sufficiently. Correction of these faults brings about disappearance of the excess weight. On the other hand, I am convinced that the endocrine "reshuffle" of puberty exercises a beneficent effect in many of the more moderate degrees of endocrinopathic prepubertal obesity, while in other cases the adiposity is progressive and may even be accentuated by puberty. In the common so-called pituitary type, menstruation and ovulation may both be affected, but they are frequently entirely normal in that large group of cases in which the disturbance is believed to be in the hypothalamus rather than in any of the endocrine glands. Many of the most extreme cases fall into this group, as exemplified by many of the fat women of the circus. Three of the questions submitted to me deal with the indications for gynecologic consultation in the adolescent girl. First of all it should be emphasized that the least important part of gynecologic consultation in patients of this age group is apt to be the examination of the pelvic organs. More important is the study of the general and endocrine status and the mode of life as to such things as exercise and diet. It is some abnormality of menstruation which most frequently brings such patients to the gynecologist, and the intelligent study of these disorders compels him to broaden his horizon far beyond the brim of the pelvis. In a large proportion of cases reassurance and education of the child and her parents is far more necessary and effective than is endocrine therapy. This applies particularly to the "shots" to which so many practitioners resort for the irregularities so common at this age. Many of the latter, such as periods of amenorrhea or menstrual arrhythmia in the first few years of menstrual life, often adjust themselves spontaneously. In reply to another question, I may again emphasize that endocrine therapy, except for the cautious use of thyroid in many cases, is rarely called for in the management of primary amenorrhea in girls under 17 unless a very definite endocrinopathy is demonstrable. Another query has to deal with a possible causal

influence of amenorrhea in schizophrenia. For this there is, so far as I know, not the slightest evidence. On the other hand, it is a well known fact that amenorrhea is a frequent finding in the various forms of insanity.

DR. RALPH H. KUNSTADTER, Chicago: The question is raised "When to treat adiposogenital dystrophies, in view of the fact that many of them recover spontaneously with the advent of puberty?" I think this depends principally on two factors. These are the physical condition of the child and the psychologic reaction. A child who is tremendously obese, knock kneed and flat footed and has a typically feminine appearance needs medical treatment. Nobody can predict when puberty is going to take place. It is supposed to occur in the male somewhere between 12 and 16 years of age. When the child is physically handicapped because of his appearance, I don't think we are justified in waiting for spontaneous improvement with puberty. I agree with Dr. Turner that many of these obese children do not improve spontaneously. As I showed in the case of the two brothers, obesity was tremendous even after puberty and adolescence occurred. If the child has a physical appearance that definitely makes him different from the normal type of child at the age when puberty is supposed to take place, he should be treated. The psychologic factor is particularly important in children who are starting in high school and are physically handicapped because of their appearance. They are frequently self conscious, particularly when they go into the swimming pools, into the gymnasiums and to social gatherings. At the present time there is criticism with regard to diagnosis of adiposogenital dystrophy from those who feel that many of these patients are simply children who overeat and will outgrow their condition if they have proper psychologic treatment and nothing more. The question of appetite is an involved subject. Meyerson has shown that overeating may be a question of some psychologic disturbance, an outlet for some emotion, particularly in women and children. They eat constantly because they haven't anything else to do or because they are disturbed or frustrated. There are also organic factors to be considered, particularly since we know that the hypothalamus is associated with appetite. Adiposogenital dystrophy may be produced by definite lesions in the hypothalamus. We now know, for example, that the pituitary itself may liberate increased or decreased amounts of sex hormone, depending on whether there is stimulation of the posterior or anterior portion of the hypothalamus. There is reason to believe that the hypothalamus is the controlling mechanism of the endocrine system, and not the pituitary.

DR. WILLARD O. THOMPSON, Chicago: Dr. McCullagh asked whether there was any danger of cryptorchism lasting until the age of 10 years or even until the age of puberty. What is the harm of waiting until then? We pointed out that the normal environment of the testis is the scrotum, and it cannot function normally except in the environment of the scrotum. The testis normally moves into the scrotum during the ninth month of fetal life. We previously thought treatment should begin at the age of about 3 years. In many instances in which the testis had descended with chorionic gonadotropin or as a result of surgical procedure carried out after unsuccessful treatment with chorionic gonadotropin we have observed that the testis, even some time after it has come down, is smaller than the testis which was originally in the scrotum and is sometimes flabby as well. In other words, in spite of being brought down it is somewhat abnormal. We are therefore beginning to wonder whether the reason for this abnormality is the fact that we did not carry out the treatment early enough, and we are beginning to revise our age for treatment downward. "Is there any danger of malignancy, or is the danger of malignancy reduced by treatment?" We do not think so. If the testis is going to develop a malignant tumor, we think it will do so whether it is in the abdomen or in the scrotum. Furthermore, we should like to point out that the danger of undescended testes becoming malignant has been greatly exaggerated. We have not seen a single instance of malignancy in all the patients with cryptorchism whom we have followed. Dr. Turner asked me to say more about the influence of the male sex hormone on growth. We have observed that growth of the skeleton in young boys and in certain dwarfs may be stimulated either by administering

chorionic gonadotropin, which stimulates the production of male sex hormones, or by administering the male sex hormone itself. "If this is so," Dr. Turner says, "why do eunuchoid individuals grow so well? Why are they sometimes even taller than the average?" That is a very good question, which nobody can answer at present. With glandular therapy we can determine at an early age whether the testis is retained by mechanical factors or whether it is not, and if it is retained by mechanical factors we can, as a result of the growth produced by glandular therapy, carry out operative procedures just as easy in a very young child as we can in the same patient without glandular therapy at the age of 12 or 14 years. It is very important that there should be no interval between the time at which glandular therapy is stopped and that at which the surgical procedure is carried out, because, if there is, some regression in size may occur which makes the operative procedures more difficult.

A PLEA FOR UNITY IN HEALTH ADMINISTRATION AT THE STATE LEVEL

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WASHINGTON, D. C.

If instead of writing a paper designed for a scientific group I were giving a sermon, I could think of no better text than item 1 from the platform of the American Medical Association as published in a number of issues of THE JOURNAL last year:

The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

Again, if this were a sermon, in adapting the text to my purposes I should need only to substitute the word state for federal. For this resolution seems to me an excellent one to apply to the agencies conducting affairs of public health within the states even as it was to apply within the structure of the federal government.

One may be inclined to qualify my use of "was" in respect to federal reorganization, but I think it is the correct tense for the situation if used without the implication that perfection has been reached. Unity of organization in the promotion of health gradually has been coming to pass at the federal level, though the form is perhaps not precisely that which the Association has been urging for many years. The establishment of the Federal Security Agency two years back brought a number of units which carry on some health activities into one general fold. At the present writing it includes these agencies: U. S. Public Health Service, Social Security Board, Civilian Conservation Corps, Food and Drug Administration, Office of Education, Freedmen's and St. Elizabeth's hospitals, American Printing House for the Blind (Louisville, Ky.), Howard University, Columbia Institution for the Deaf and the National Youth Administration.

The United States Public Health Service is concerned solely with matters pertaining to human health. It is charged with direct administrative responsibility for certain duties. To other activities it contributes technical direction. When occasion demands, as occasion regularly does, the Service acts in an advisory capacity to federal agencies which must maintain a program of health as part of their own operations. Two medical officers, for example, are assigned to the

From the Division of Domestic Quarantine.
Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

National Youth Administration to guide the development of certain medical services which are an integral part of the responsibility of this agency to its beneficiaries.

Though the Federal Security Agency may seem rather loosely knit from a medical point of view, the intent of item 1 of the platform of the American Medical Association is being carried out in an evolutionary way.

My plea for the application of this principle to state agencies does not imply too close an analogy between the structure for public health within the federal and within the state governments. The state agencies differ from those at the federal level chiefly in that they carry direct responsibility for the administration of service programs. It is precisely in this departure that one recognizes the even greater need for unity of organization. For it is particularly among operating agencies of service that aims and duties are apt to overlap and underlap and sometimes collide, and a likely corollary to the confusion is great waste of effort, energy and of course money. The zealot for good public health administration would find the health structure of the states a rich field in which to exercise his ardor.

The United States Public Health Service has on hand some recent, exact data on this confusion of effort, which were gathered for a revision of Public Health Bulletin 184,¹ the descendant of the survey of state health organizations published by the American Medical Association in 1915.² The current revision will be a new version. Not only have the previous data, as is the way of all data, grown old and inadequate, but the public health scene has undergone a great transformation. Health departments today are participating in programs which had not been developed as recently as ten years ago. Either the technics were inadequate or the activities were considered outside the bounds of public health administration.

Furthermore, the emphasis was shifted somewhat in planning the forthcoming revision. The other bulletins amounted to a study of the divisions of state health departments, and the approach in gathering the data might be summed up by the question "What does this division do?" Such a study gives a picture of a division at work. In the latest survey the approach could be characterized by the questions "What branches of this state government are responsible for the work in (for instance) tuberculosis?" and "What is the total program?" The answers add up to the current story for each field of activity in terms of which agencies are operating there and what they are doing. On that emphasis hangs this tale of duplication and lost motion.

The survey schedule included all the old line public health fields, such as vital statistics; acute communicable disease control; maternal and child health; control of tuberculosis, including hospitalization; sanitation of food, milk and water supplies, and sewage disposal.

Other activities in the schedule included some not commonly undertaken in public health programs. Social thought in the last ten years has been busily coordinating considerations of personal health, economic security and happiness. The conclusions reached are by no means hard and fast. But the present survey

has been conditioned far more than the others were by considerations of what in the light of present knowledge should go into the efforts to promote the public's health.

A program such as that for the control of the venereal diseases represents a combination of the old and the new aims. Syphilis is a communicable disease, but it is a clinical entity as well, and the programs recognize both these facts. Society is to be protected. The individual is to receive the diagnosis and treatment that will rid him of his disease.

The schedule as set up does not define public health as a program of any particular content. Care was taken to avoid having it do just that. Also, the purpose of an activity was not decided according to where the administrative responsibility had been placed. The inclusion or exclusion of an item was decided by whether the item was usually defended before appropriating bodies on the basis of its influence on human health and well-being.

Each function was traced in all its ramifications through the entire structure of state government, irrespective of where administrative responsibility had been placed. The infant hygiene program, for example, would usually be found in the health department, but the supervision of institutions for the care of children, a vital part of any program of infant hygiene, might be vested in the department of welfare.

As far as possible, under each major category of service were listed the several participating state agencies. Participation was accounted for under five headings: regulation, promotion and education, supervision and advice, financial aid to local units and operation of direct service programs.

This list is a generalization for the nation as a whole. A state may use one or any combination of the approaches in it, in a complete health program or a partial one and through an astonishing multiplicity of agencies. In other words, no uniform pattern as to organization or program exists throughout this country.

In one state the activities relating to health are in the hands of no less than eighteen separate agencies. The smallest number of agencies involved in any one state is six. The median number of departments, boards and commissions is eleven per state.

Haphazard is the word for the situation. An artist given to surrealism would be best equipped to present a picture of the haphazardness in all its glowing complexity, but both talent and time restrict me to a word picture of a few activities and the agencies that father them.

In general, the states vary most in their ideas as to the portion of responsibility to be borne by the state agency and the portion to be delegated to local jurisdictions. One state may cleave entirely to advisory, supervisory and promotional activities. Another may be active in programs of direct service, such as those which involve treatment for the venereal diseases or roentgenograms of the chest. Or a state may hold some programs to the advisory function and consider others of value only if they carry direct services. One state may grant financial aid for activities far different from the ones selected for this type of assistance by its neighbor.

The administration of tuberculosis control programs offers an interesting case study of the variety that is the spice of life under some circumstances but a drawback to life when practiced by the agencies that should be working with all possible precision to promote health.

1. Ferrell, J. A.; Smillie, W. G.; Covington, P. W., and Mead, Pauline A.: *Health Departments of States and Provinces of the United States and Canada*, Public Health Bulletin 184, revised, United States Treasury Department, Public Health Service, 1932.

2. Chapin, C. V.: *A Report of State Public Health Work, Based on a Survey of State Boards of Health*, Chicago, American Medical Association, 1915.

Contact B was a school contact of patients 3 and 4 and also attended the school picnic on June 6. This boy lived with his mother in La Grange. The father (patient 11) of this child was separated from the mother and lived in Berwyn, 4.9 miles from La Grange. The child visited with his father on June 7, 14, 19, 21 and July 2, during which time they swam, ate and attended the theater together. From June 21 to July 2 the boy had an active smallpox revaccination that confined him to his home. On July 5 the father became ill with an ascending paralytic poliomyelitis, which terminated in respiratory paralysis and death on July 9. Examination of the brain and cord revealed extensive and profound histopathologic changes characteristic of severe poliomyelitis. The son (contact B) left the state and could not be located until the first part of August, at which time a stool specimen was obtained from which the virus of poliomyelitis was subsequently isolated. An additional noteworthy fact is that patient 11 worked in a large administrative office in Chicago and some of his associates lived in Western Springs and Oak Park. The father of patient 10, who contracted poliomyelitis on July 3, was also a worker in this office but it was

Paralysis, Inc.
From the Cook County Public Health Unit (Dr. Edward A. Piseczek,
director) the Division of the Illinois Department of Public
Health (Dr. Roland R. Black), Michael Deutsch Serum
Center of the Michael Reese Hospital, chairman, director
of the Cook County Public Health Unit, Black, professor of
pediatrics, Loyola University, Dr. Herman N. Cross,
Bundesen, president, Chicago Board of Health; Dr. Roland R. Cross,
director, Illinois Department of Public Health; Dr. Irving Cutter, former
dean, Northwestern University Medical School; Dr. Morris Fishbein,
Editor, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION;
Mr. Arthur Gorman, engineer of Water Purification Division, City of
Chicago; Dr. Sidney O. Levinson, director, Samuel Deutsch Serum Center
of Michael Reese Hospital; Dr. Howard J. Shaughnessy, chief, Division
of Laboratories, Illinois Department of Public Health, and Dr. Winston H.
Tucker, Health Commissioner, Evanston, Ill.

not possible to determine the degree of contact between the two men. It is also of interest that patient 10 spent the night of June 21 visiting friends in Western Springs.

Contact C was a school playmate of patient 4 and at no time showed any signs of illness, but his 14

TABLE 1.—*Acute Anterior Poliomyelitis in Western Suburban Cook County, 1941*

By Case Number, Date of First Symptoms, Age, Sex, Color Location and Disease Course						
Case No.	Date of First Symptoms	Age	Sex	Color	Location	Disease Course
1	6/4/41	6	♀	White	La Grange	Paralysis
2	6/10/41	10	♂	White	La Grange Park	Complete recovery
3	6/12/41	10	♂	White	La Grange Park	Complete recovery
4	6/14/41	13	♂	White	La Grange Park	Paralysis
5	6/20/41	5	♂	White	Western Springs	Paralysis
6	6/26/41	14	♀	White	La Grange	Paralysis
7	6/26/41	12	♀	White	Western Springs	Paralysis
8	7/1/41	14	♂	White	Park Ridge	Complete recovery
9	7/2/41	9	♂	Negro	La Grange	Complete recovery
10	7/3/41	5	♂	White	Oak Park	Paralysis
11	7/5/41	35	♂	White	Berwyn	Fatal
12	7/6/41	11	♂	White	Western Springs	Complete recovery
13	7/7/41	8	♂	White	Park Ridge	Complete recovery
14	7/10/41	11	♂	White	Western Springs	Fatal
15	7/11/41	23	♀	White	Western Springs	Paralysis

year old sister (patient 6) became ill with poliomyelitis on June 26.

Contact D on June 27 drank some of the lemonade remaining after the closure of the stand on June 26. On June 30 this boy had his adenoids removed for the second time. He returned from the hospital the following day and remained indoors until July 4. He later stated that during this period his joints and back ached and at times he felt dizzy. He also said that once he saw double. However, there was no history of fever, headache, stiff neck or stiff back. On July 4 he attended the aforementioned village celebration, at which time he was in contact with patient 12. His 23 year old sister (patient 15) became ill with poliomyelitis on July 11. The stool specimen collected from contact D was subsequently shown to contain the virus of poliomyelitis.

Patients 2, 3 and 4 lived in La Grange Park. Patients 1, 6 and 9 lived in La Grange. Patient 9, a Negro boy,

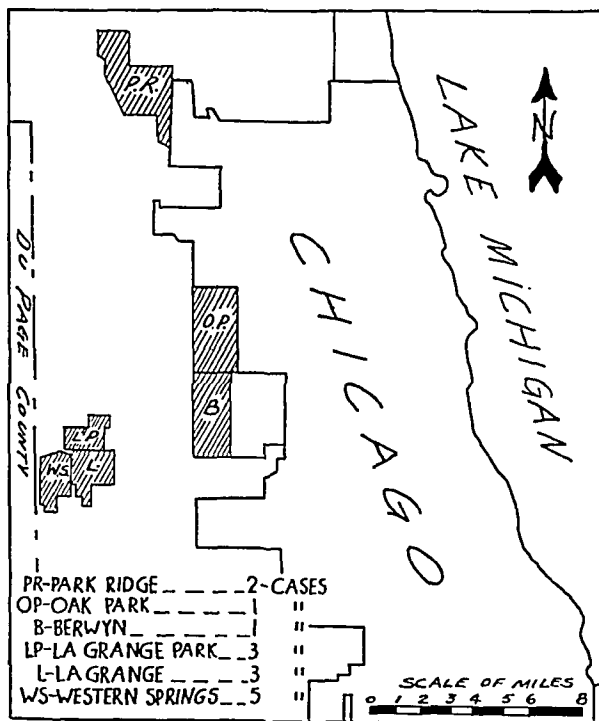
TABLE 2.—*Results of Injection of Stool Specimens*

	Number Collected	Number Injected to Date	Number Positive	Number Remaining for Injection
Cases.....	5	4	3	1
Contacts (type)				
Family.....	16	12	1	4
Playmate.....	9	6	1	3
Lemonade.....	6	5	1	0
Family-lemonade.....	6	6	2	0
Playmate-lemonade.....	8	6	1	2
Casual or indirect.....	4	3	0	1
Total.....	48	38	6	10
Controls				
Normal.....	20	14	0	6
Diarrhea.....	5	0	0	5

was the son of a mail carrier whose route was in La Grange. There was no other detectable contact between this patient and other patients in this vicinity. Patients 5, 7, 12, 14 and 15 lived in Western Springs. Patients 8 and 13 lived in Park Ridge approximately 12 miles away from the aforementioned areas, and no contact could be traced between the Park Ridge patients and the others.

The epidemiologic survey disclosed three separate sources of drinking water, nine different milk supplies and attendance at ten different schools. Five of the patients swam in four different swimming pools. A trained physical therapist made a complete muscle examination of all the contacts to the patients involved in this study with the thought that there may have been some mild unrecognized cases. No muscle weakness or paralysis was found among these contacts.

When it was ascertained that funds would be available for laboratory study of this outbreak, the prompt collection of stool specimens was started. The laboratory study was restricted to the four contacts A, B, C and D, the 5 Western Springs patients 5, 6, 12, 14 and 15 and family, playmate, lemonade stand (lemonade drinkers only) and indirect or casual contacts of these patients. The number and type of stools collected and the results to date are presented in table 2. For control



Geographic distribution of cases.

25 residents of Western Springs who were of the same age group as the patients and who had no known contact with the patients or their contacts submitted stool specimens for study. Five of the control group had attacks of diarrhea during the time of this outbreak.

METHOD OF COLLECTION, PREPARATION AND INOCULATION OF STOOL SPECIMENS

The stool specimens, weighing about 45 Gm. each, were collected in sterile glass jars and refrigerated in an insulated box until delivered to the laboratory, usually within twelve hours. In the laboratory they were kept at approximately 8 C. for twenty-four hours and then frozen in the freezing compartment of an electric refrigerator or with solid carbon dioxide. They were maintained in the frozen state until prepared for inoculation.

Rhesus monkeys (*Macaca mulatta*) were inoculated by the combined intranasal and intraperitoneal routes. Untreated feces, diluted with sterile distilled water from 1:2 to 1:20, depending on their consistency (on the

the 6 contacts from whom virus was isolated were in the group around the lemonade stand and includes contact D. One, contact B, was in contact with patients 3 and 4 before and at the school picnic, and the sixth was a playmate contact of patient 5.

The primary virus isolations were confirmed by histopathologic findings and by monkey passage in 4 of the contacts. Guinea pigs and mice inoculated with this material remained asymptomatic. Confirmation studies on the remaining two virus isolations from contacts are in progress.

Fourteen control stool specimens have been inoculated up to the present time. Although some of the monkeys exhibited high temperatures after short incubation periods, there was no evidence of paralysis in any of the monkeys inoculated with the control specimens. The cause of this atypical febrile reaction is being investigated.

As indicated in table 2, we have yet to study the feces from 1 case, 10 contacts and 11 controls. We are also studying the persistence of the virus in the stools of cases and contacts.

SUMMARY

A combined clinical, epidemiologic and laboratory study of a suburban outbreak of poliomyelitis has been partially completed. Typical clinical findings in the cases and demonstration of the specific pathology of the disease in one of the fatal cases, and isolation of the poliomyelitis virus from the feces of patients proved it to be an outbreak of poliomyelitis.

The virus of poliomyelitis was isolated from the feces of 3 of 4 patients collected about one month after the onset of symptoms.

The virus was found in the stools of 6¹ of 38 contacts; on the other hand, there has been failure to isolate the virus from 14 control specimens of feces from normal residents in the community.

Virus was found in the stools of two presumably healthy children who were in contact with adult members of their families who became ill with poliomyelitis.

Virus has been isolated from a presumably healthy person two months after his contact with persons who became ill with poliomyelitis and one month after contact with his father, who died of poliomyelitis.

737 South Wolcott Avenue.

What Is Medical Research?—Mere recording of observations and reading the dials of complicated instruments of precision is not research. Becoming acquainted with all the doctrines, axioms and concepts in a particular field is not research, though it may well precede research. Summarizing or compiling facts is not research. A research man must know his data and how they were obtained. The mere compiler can be ignorant of his material. Such records, without a hypothesis to explain the cause or correlation of some element or aspect they present, and a fresh test of that theory, are merely records. Long study is not research; study alone is passive. It may be swallowing but it is not digestion. Rationalizing and contemplating lack the confirmation secured by testing the proposed explanation. Analysis is a valued element of research method but it is not all there is to research. . . . Another confusion lies in mistaking the result for the cause. Research may lead to invention, or invention may call for research, but invention is not research. Indeed, medical research is often handicapped if it is pressed to be immediately applicable. This is rarely understood by the outside. Research is the response to curiosity, not to need.—Gregg, Alan: *The Futherance of Medical Research*. New Haven, Conn., Yale University Press, 1941.

GASOLINE INTOXICATION

WILLARD MACHLE, M.D.

CINCINNATI

Although poisoning by petroleum distillates has been a recognized clinical condition ever since these products began to find commercial use, few cases have been reported, probably because they are of sporadic occurrence and in cases of mild acute poisoning recovery is usually prompt and complete. Opportunities for harmful exposure are frequent however, and, as gasoline has become a material essential in daily life and its distribution is constantly increasing, intoxication by gasoline will doubtless become more, rather than less, frequent.

The monthly consumption of gasoline in the United States increased from about 1,000,000,000 gallons in 1927 to more than 2,000,000,000 gallons in 1940,¹ and this was due almost entirely to its increased use as a motor fuel. As a result, the persons having a possible exposure to gasoline include greater numbers of motorists and also greater numbers of men employed in its production, distribution and marketing. The number of gasoline service stations has more than doubled in the past fifteen years; there were 226,000 in 1938, and about 100,000 new pumps are put into service each year. Furthermore, the expansion of the motorized divisions and the aviation branch of the armed forces has led and will continue to lead to increasing handling and use of gasoline, under conditions somewhat less than ideal, in certain instances, from the point of view of safety.

THE AGENT

Gasoline is a mixture of petroleum hydrocarbons having a distillation range of from less than 100 to about 400 F. Its composition varies with its source and is never completely known, but in general there are four groups of components—paraffins, olefins, naphthenes and aromatics. Straight run gasoline made from petroleum produced in the United States is principally paraffinic in character and may contain more than 65 per cent of paraffin hydrocarbons. Several crude oils in the western part of the United States, however, yield straight run gasolines which are much more aromatic or naphthenic in character than the general type of fuel, although the total content of aromatic hydrocarbons in these gasolines will probably not exceed 10 per cent. Many foreign crude oils do yield highly aromatic gasolines, notably Borneo petroleum, in which nearly 40 per cent of aromatic hydrocarbons are present in the gasoline fraction. These aromatic hydrocarbons are principally benzene, toluene and the xylenes. All straight run gasolines contain naphthene hydrocarbons in varying proportions, but the content of olefin hydrocarbons is negligible.

The type of chemical compounds present in a gasoline also depends on the way in which it has been made. Vapor-phase cracked gasoline, for example, is highly unsaturated and quite reactive chemically because it contains from 50 to 75 per cent of olefin hydrocarbons. The rest of these gasolines are composed principally of

¹From the Kettering Laboratory of Applied Physiology, University of Cincinnati College of Medicine.

1. Hubner, W. H., Refinery Technology Division, Ethyl Gasoline Corporation: Personal communication to the author.

aromatic and naphthenic hydrocarbons, there being practically no paraffins present. With improved methods of manufacture designed to give a greater yield, there has been a change in the type of gasoline marketed. In 1925 two thirds of the total production was straight run and natural, consisting mainly of paraffinic hydrocarbons, types which today make up only about 40 per cent of the total, while cracked, reformed or polymerized gasolines, all with a high olefin and aromatic content, make up the remaining 60 per cent.²

The physiologic response to the various compounds in and fractions of gasoline varies widely.³ The unsaturated compounds, especially the aromatics, have definite convulsant effects, while in general the irritant and toxic effects of a given series of like compounds increase with increase in molecular weight.

Two other changes, noteworthy from a toxicologic point of view, have been made in the past fifteen years: both the vapor pressure and the volatility have increased slightly. The 10 per cent point of winter gasoline (160 F. in 1925) was only 125 F. in 1940,¹ and from the standpoint of health hazards this increased volatility is of considerable significance.

Although it is known that the hydrocarbon content of gasoline is the portion that causes poisoning, questions have been raised concerning certain agents which are added to gasoline to increase its effectiveness, particularly tetraethyl lead. This has been used in gasoline continuously since 1926 in concentrations not exceeding (for motor fuel) 1 to 1,260 by volume. Investigations and reports over a span of years have demonstrated that lead poisoning will not result from the use of leaded gasoline as it is usually handled in commerce.⁴ The hazard is limited to the manufacture of the tetraethyl lead and the antiknock mixtures, the mixing of these materials with gasoline and the cleaning of tanks in which leaded gasoline has been stored. Numerous reports of lead poisoning caused by the handling of motor fuel containing tetraethyl lead have been brought to my attention, and several published articles have considered this possibility, but in every instance careful investigation has established that plumbism was not a factor in the production of illness.

A number of materials, usually phenolic compounds, particularly polyhydroxy and amino phenols, are often added to gasoline to prevent oxidation during storage and to delay formation of gum.¹ Because of their low vapor pressures and the low concentrations employed (0.001-0.002 per cent), they have no hygienic significance. This is true also of other adjuvants sometimes added to gasoline such as lubricating oils, colloidal graphite and lecithin.

ETIOLOGY

Gasoline intoxication occurs with considerable frequency outside the petroleum industry;⁵ substitution of gasoline for solvents, its industrial use and careless handling are chiefly responsible. Severe chronic gasoline poisoning has occurred in dry cleaning plants; the pressing of clothes still damp with gasoline is dangerous because high temperatures volatilize the more toxic, heavier fractions, and the toxicity is said to be likewise increased.⁶

Gasoline is sometimes ingested accidentally, usually by children but also by motorists attempting to siphon it from tanks. Water from wells contaminated by gaso-

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- 6 Liftschütz, J. I. Effects of Temperature Conditions on the Toxicity of Automobile Gasoline, *Hig. truda tekhn. Bezopasnosti* 13: 12, 1937, *Chimie et industrie* 36: 62, 1936
- 2 Dunstan, A. E., and others. The Science of Petroleum, New York, Oxford University Press, 1938
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- 4 Sayers, R. R., and others. Experimental Studies on the Effect of Ethyl Gasoline and Its Combustion Products, Department of Commerce, United States Bureau of Mines, 1927
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line is an infrequent source of poisoning. The single oral dose usually fatal to man is approximately 7.5 Gm. per kilogram, but death has been caused by as little as 10 Gm.⁷ and recovery has followed the ingestion of 250 Gm.⁸ This divergence may be due in part to the wide variability in the chemical composition of gasoline; it is absorbed more quickly if it contains a high concentration of benzene and other aromatic hydrocarbons, since the solubility product of benzene in blood, like the coefficient of water solubility, is from three to four times as great as that of natural gasoline.⁹ Other factors are also of importance, however. In the most serious of Nunn and Martin's cases,¹⁰ some of which were fatal, there was evidence that liquid had been aspirated. Emesis and the time interval between the ingestion and its occurrence are also of great importance, since they influence the effective dose retained. Individual susceptibility and the presence of food and fats in the stomach, tending to delay absorption, must be considered. It is probable that some habituation occurs on repeated ingestion. Schwarz's¹¹ patient drank from 3 to 5 cc. of gasoline once or twice daily for from five to six weeks and recovered from the effects.

There is no conclusive evidence that systemic poisoning from gasoline can be produced in man by cutaneous absorption alone. In Lassar's case¹² gasoline was applied to the skin as a remedy for scabies, and death followed in two days, but inhalation probably played a role. Friedeberg¹³ states that sufficient gasoline can be absorbed through the skin to cause intoxication, but from my own observations the hazard from cutaneous absorption in man would seem to be slight indeed and of little practical importance when compared with the exposure to vapor that usually coexists. Lasareff's experiments¹⁴ indicate that definite absorption occurs through the skin of rabbits.

The usual mode of absorption of gasoline is through the respiratory tract. As in the case of other volatile materials, if the concentration of gasoline vapor in air is high, absorption through the lungs may be extremely rapid and symptoms may appear after a few minutes of exposure. There is no agreement as to the amounts necessary to cause intoxication. The Massachusetts code¹⁵ sets the maximum allowable concentration at 1,000 parts per million (4.5 mg. per liter), and this is close to the figure given by Fieldner.¹⁶ We feel, however, that it may be too high for continuous work. Susceptible persons may show symptoms after exposure

to concentrations as low as 300 to 500 parts per million, for example the functional neuroses in rubber workers reported by Vigdortschik¹⁷ following exposure to concentrations of 110 to 450 parts per million. In Fieldner's test, men exposed to 1,000 parts per million showed drowsiness, dulness and numbness at the end of fifteen minutes and vertigo, ataxia and slight nausea as well at the end of an hour. Symptoms appeared much more quickly with exposures to 3,000 parts per million, and with exposure to 7,000 parts per million there was definite intoxication in five minutes.

Few data are available on the amounts of gasoline vapor in air that will cause death in man in a short period of exposure, but amounts in excess of 10,000 parts per million are rapidly fatal for most experimental animals. Since gasoline vapor is heavier than air, concentrations far in excess of these may readily occur if gasoline is decanted or exposed to air in enclosed places and concentrations rapidly fatal to man may be formed. Moreover, in tanks, excavations and other poorly ventilated enclosures the displacement of air by the heavier vapors adds the further hazard of asphyxia.

Susceptibility to gasoline vapor varies greatly, and habituation is a usual phenomenon, as we learned in a study of men engaged in filling barrels with gasoline in a poorly ventilated location.¹⁸ The reason is not understood. Experiments attempting to relate habituation to changes in the blood lipids have given conflicting results.¹⁹ Since gasoline is apparently not oxidized or broken down to any significant degree in the body (excretion is mainly by way of the lungs), this question must remain unanswered for the present.

PATHOLOGY

The pathologic changes caused by gasoline are dependent on both its irritant action and its lipolytic activity. There is no characteristic general morbid anatomy, but study of reports²⁰ reveals almost uniformly damage to the lungs manifested by hyperemia, petechial hemorrhages, subpleural extravasations and, in some cases, gross pulmonary hemorrhages which may involve the entire lobules, with the alveoli filled and the epithelium necrotic. Bronchitis is frequent. Pleural effusion was an outstanding finding in 1 case reported by Johnstone.²¹ Some degree of pneumonitis is usually present, especially if the gasoline has been ingested and aspiration has occurred, or simply as the result of its excretion by the lungs. Although as a rule most pronounced in the lungs, damage to the vascular endothelium is seen in many tissues, such as subserous

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21. Johnstone, R. T.: Pleural Effusion from Gasoline Inhalation, *Indust. Med.* 7: 243, 1938.

hemorrhages in the liver, kidney and spleen and hemorrhages into the serous cavities in animal experiments. In addition, there is evidence of general damage to the parenchymatous organs. The liver may be enlarged and show cloudy swelling, usually centrilobular, and there may be fatty changes. In the kidney, edema may be considerable; damage is mainly in the proximal convoluted tubules and the glomeruli, where lipid degenerative changes are seen, with deposits of albuminous material within the glomerular spaces.

Few studies of the nervous system in acute poisoning have been reported, and the changes described are not specific. Hyperemia and edema of the brain and meninges are usually present, and perivascular extravasations occur here as elsewhere. Myelin swelling is usual, and, in 1 case²² in which peripheral neuritis had resulted from the poisoning, part of the fibers were partially denuded of myelin, with gross swelling of the nerves.

As in any acute general intoxication, the types and degree of pathologic change are influenced by the interval between ingestion or exposure and death. If death occurs within a few minutes or hours, few changes may be seen other than edema of the lungs and central nervous system and congestion and scattered hemorrhages, especially in the lungs. If days or weeks elapse, one sees in addition variable degrees of necrosis in the lungs, cellular reaction, fibrin deposits, blood pigment and regenerative changes in the liver and kidneys.

In chronic poisoning the anatomic changes are neither pronounced nor specific. Following ingestion, dilatation of the stomach is usual, as well as hyperemia and edema of the enteric mucosa. Submucosal and interstitial hemorrhages may be present. Hepatic and renal sclerosis were reported in 1 case of chronic involvement.²³

SYMPTOMS AND SIGNS

Acute Intoxication.—Acute poisoning is characterized by severe symptoms in the central nervous system. When exposure is to very high concentrations of gasoline vapor in air, such as may occur in tanks, the victim falls to the ground in a comatose state and may die at once or within a few hours without regaining consciousness. When death is somewhat delayed, the onset of coma may be less rapid and the acute anesthetic action of the gasoline may cause initial symptoms like those of acute alcoholic intoxication: a brief period of incoordination, restlessness and great excitement, with combativeness and swearing, mental confusion, disorientation, ataxia and possibly disturbances of speech and of swallowing. Delirium follows, and coma, which may last for a few hours to several days. The type of coma seems to be dependent to a considerable degree on the chemical nature of the gasoline. In general, paraffin hydrocarbons produce a relatively quiet coma, as has been demonstrated by animal experimentation. Unsaturated hydrocarbons, particularly the aromatic series, cause convulsions, motor unrest, tremors and motor disturbance. Extreme jactitation has been noted frequently, particularly in the animal experiments of Haggard,²³ and muscular twitching is common. Meningismus may be present. In severe

cases epileptiform convulsions are frequent, and they may continue for some time after the coma has passed.

The pulse shows variable changes. Usually weak and rapid in the early stages of coma, it is often full in the presence of considerable motor unrest; bradycardia was noted in several cases, however, and was attributed to stimulation of the vagus nuclei. In general the pulse returns slowly to normal with recovery. A peripheral vasomotor paralysis or acrocyanosis is frequently found and is apparently the result of direct action of the agent on the vessels, since drug response is abolished.²⁴ The temperature is usually subnormal but a rise in temperature of 1 to 2 degrees is seen occasionally, and in very sick patients and in terminal states it has reached 106 F. Respirations are usually shallow and rapid, particularly if poisoning has been by ingestion with some aspiration. Irregularity of respiration is common, particularly in children, and sudden apnea may occur when the patient seems to be doing well.¹⁰

In quiet coma the superficial and deep reflexes are absent or extremely weak, but with jactitation and convulsions, meningismus and violent motor unrest they may be greatly increased, almost to the point of clonus. Unilateral and bilateral reversal of the plantar reflex may be seen. The disks are usually pale. The pupils are dilated, as a rule, and may be unequal. Often they are fixed, and varying degrees of nystagmus may be present. Conjugate deviation has been noted frequently, as has strabismus. Other cerebellar symptoms may be prominent, and there may be *asynergia* and *adiadokocinesis*. Vomiting and singultus sometimes occur during coma and may persist long after.

In cases of subacute involvement in which symptoms may not appear for several hours there are various premonitory symptoms: headache, usually described simply as a feeling of pressure over the head, blurred vision, vertigo, ataxia, tinnitus, nausea and anorexia, weakness and in some cases general abdominal pain. With these symptoms there develops a state of intoxication like that produced by alcohol, known as "naphtha jag." The sensation may be pleasurable and persons have been known to inhale gasoline vapors intentionally, but for the most part the patient becomes quarrelsome and combative, swears violently and evinces a poorly controlled behavior.

Whether or not this prodromal period is followed by more serious symptoms depends on two factors: the duration of the exposure and its constancy. Because of the low solubility of hydrocarbon vapor in blood, exposure must continue for some minutes to bring about conditions of equilibrium and maximum effect.

Under most conditions of exposure in the ranges that cause subacute poisoning, the concentrations are not constant but vary within rather wide limits, and any sudden great increase in concentration will be quickly followed by more severe symptoms.

If poisoning has been by ingestion, with no aspiration of the gasoline, symptoms develop more slowly than in poisoning by inhalation, because of the slow rate of absorption of the agent from the intestine.

Chronic Intoxication.—This term is applied to poisoning which results from exposure to low concentrations of gasoline vapor for long periods of time; severe acute

22. Duvic, M., and others: Question of Existence of Polymyositis Caused by Benzene as Occupational Disease: Case of Hyperchromic Pernicious Anemia and Polymyositis in Woman Working with Benzene, Bull. et mém. Soc. méd. d. hôp. de Paris 54: 359, 1938.
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24. Dautrebande, L., and others: Paralysis of Peripheral Vasomotor System by Benzene: Epinephrine-Benzene Syncope, Compt. rend. Soc. de Biol. 117: 90, 1934.

symptoms do not appear, but minor symptoms of a general nature are manifested a few weeks or months after the exposure has started and become progressively worse. The patient may become disabled in a month or in several years.

Considerable difference of opinion exists as to the incidence of chronic gasoline intoxication. Hamilton²⁵ states that chronic naphtha poisoning is probably common. Our experience indicates that it is rare. We have had more than 2,300 refinery workers under observation, in some instances for as long as ten to twelve years, and have found no signs of chronic gasoline poisoning in any case.¹⁸ Most of these men were employed for brief periods of time, usually not more than a few hours a week, in mixing ethyl fluid with gasoline and for the remainder of their time in all types of refinery work entailing gasoline exposures of all types and degrees of severity. Negative results, in respect to signs of chronic gasoline intoxication, were also obtained in studies of large numbers of filling station attendants, tank wagon drivers and garage mechanics.

On the other hand, in a group of barrel fillers, exposed to concentrations of gasoline vapor tolerable only to habituated persons, we found undernutrition and pallor and significantly low values for hemoglobin and erythrocytes in a high proportion of the subjects. There were frequent complaints of anorexia, nausea and nervousness, and these symptoms were usually related either to a return to work following an interval of freedom from exposure or to brief periods of increased exposure. The condition of these men may be considered one of chronic intoxication or the result of repeated subacute episodes with injury cumulative to a degree.

The clinical manifestations in chronic gasoline intoxication are usually reported to be vague and not characteristic. In Spencer's study²⁶ of 22 persons exposed to gasoline vapors from coupon-canceling machines, the principal symptoms noted were headaches, vertigo, drowsiness, conjunctival irritation with lacrimation, excitability and mild nervous symptoms. A high incidence of dispensary attendance, also noted, might not have been significant had it not been lowered to control levels after kerosene was substituted for gasoline in the operation.

The first symptoms to appear in chronic intoxication are those of a general nature or psychasthenic and neurasthenic manifestations, and they are followed by muscular weakness and cramps, listlessness and a feeling of dullness, fatigue and loss of weight. This loss may reach high proportions: for example, Hayhurst's²⁷ patients lost from 10 to 60 per cent of their body weight over a period of months. Irritative properties of the vapor usually cause conjunctivitis with lacrimation and cough with expectoration. Pulmonary hemorrhage has been reported²⁸ but is uncommon.

Symptoms on the part of the central nervous system occur in wide variety and degree. They may be listed

as follows: mental confusion, loss of memory, a sense of impaired mental faculties, depression, irritability and nervousness; listlessness and dullness sometimes associated with pronounced apathy; some degree of ataxia, possibly with tremor; numbness, paresthesia, muscular pain perhaps lancinating, pains in the limbs, nerve tenderness, neuritis and paralysis of peripheral or cranial nerves of the chronic type and associated with but little pain and either motor, sensory or mixed. Cerebellar signs, often overshadowed in cases of acute or of subacute involvement, may be the only finding. Ataxia may be accompanied by incoordination and cerebellar gait. Vertigo, one of the frequent and early signs, may be severe and associated with nystagmus, tinnitus and impairment of hearing. Drowsiness by day may be followed by insomnia by night. Retrobulbar neuritis has been reported.²⁹

When other symptoms are present, indigestion is usual and morning anorexia may be associated with some nausea, rarely with vomiting. Generalized abdominal pain is a frequent complaint, and there may be either constipation or diarrhea. Changes on the part of the circulatory system are not considerable. The pulse rate is usually increased.

LABORATORY EXAMINATIONS

Laboratory findings are not remarkable. In acute and subacute intoxication the blood changes are not characteristic; the erythrocyte count is influenced to a great extent by the degree of hemoconcentration and the varying effects of hemorrhage, and the picture, both in the blood and in the marrow, may be further complicated by the effects of benzene present in the gasoline. A reduction in number of erythrocytes and in the hemoglobin content reported as occurring in some cases has been obscured by hemoconcentration in others. The leukocyte count tends in the main to be somewhat elevated and, when pneumonitis is present, may be as high as 20,000 to 30,000, with a relative increase in granulocytes, this increase obtaining shortly after exposure. Later the leukocyte count will be further influenced by the degree of secondary infection in the pneumonitic areas. Moderate eosinophilia of from 3 to 6 per cent has been reported in a number of cases but is not of sufficiently consistent occurrence to have diagnostic value.

The specific effect of gasoline, or benzene, on the blood seems to be elicited only in chronic intoxication. In cases of chronic gasoline poisoning some degree of anemia is usual. Hemoglobin may vary from 60 to 90 per cent, with 3 to 4 million erythrocytes. Leukocytes are little changed, usually slightly increased. In those cases in which leukopenia has been reported there has usually been exposure to gasoline of high benzene content. Thrombopenia, purpura and epistaxis may also occur.

Changes in the blood chemistry are not significant. Urea and total nitrogen may be slightly increased in the presence of acute symptoms. Blood sugar is usually within normal limits. Loewenberg³⁰ noted that in experimental animals the blood cholesterol may be halved, but in man it is only slightly decreased. The assumed direct relationship between concentration of

²⁵ Hamilton, Alice. *Industrial Poisons in the United States*, New York, Mcmillan Company, 1925, chapter 28, pp. 400-409.

²⁶ Spencer, O. M. The Effect of Gasoline Fumes on Dispensary Attendance and Output in a Group of Workers, *Pub. Health Rep.* 37: 2291 (Sept. 22) 1922.

²⁷ Hayhurst, E. R. Poisoning by Petroleum Distillates, *Indust. Med.* 5: 53, 1936.

²⁸ Klare. Benzene Poisoning, *Aertze Sachverst. Ztg.* 12: 93 and 116, 1907. Racine. Fatal Benzene Poisoning, *Vrtylschr. f. gerichtl. Med.* 22: 63, 1901. Loewenberg.²⁹

²⁹ Peters. Retrobulbar Neuritis from Chronic Benzene Poisoning, *Deutsche med. Wchnschr.* (supp.) 26: 249, 1909.

³⁰ Loewenberg, R. D. Practical Significance of Benzene, Benzene and Their Combustion Products in Industry, Occupations and Traffic *Fortschr. d. Med.* 50: 394, 433 and 478, 1932.

blood lipids and susceptibility to intoxication has not been confirmed.

Albuminuria occurs in from 10 to 20 per cent of cases and usually appears three or four days after exposure.

SEQUELAE

Mild, nondisabling sequelae probably follow acute intoxication more often than has been reported. Unless severe and persistent, sequelae are difficult of interpretation and simultaneous exposure to other noxious agents, such as carbon monoxide,³¹ often complicates the picture. Serious, clear-cut sequelae have been limited to cases in which exposure was by inhalation, except for one case of Schwarz,¹¹ in which severe polyneuritis lasting seven months followed the daily ingestion of from 3 to 5 cc. of gasoline for a period of from five to six weeks.

The most common of the sequelae are peripheral neuritis, impairment of memory, dulness of intellect, numbness of the extremities, cranial nerve palsies, retrobulbar neuritis and epileptiform seizures. Thus they are limited almost entirely to the central nervous system, although chronic pneumonitis has also been reported in 2 cases.

Epileptic attacks are by far the most serious sequela to acute intoxication. Four instances, 3 of them rather sketchily reported, are on record. In Johnstone's²¹ case acute intoxication from inhalation was followed twenty-four hours later by coma and convulsions, with clonic twitching on the right side. The patient recovered in seven days and worked for two months, at which time he suffered another attack of coma and convulsions in the absence of exposure. During the attacks the pupils were fixed and unequal and there was conjugate deviation and a Babinski reflex was elicited. In the succeeding eighteen months seizures continued, without loss of consciousness in the mild attacks. Examination at this time showed mainly left-sided focal cerebral symptoms, conjugate deviation and the Babinski reflex, with inequality of the tendon reflexes, unilateral muscular twitchings and a fixed facial expression. In Floret's case,³² that of a young girl who suffered an acute attack from the inhalation of vapors, followed by excitement, coma and convulsions, repeated convulsive seizures and periods of excitement recurred frequently for one year after recovery from the acute attack. In the interval, neurologic examinations gave negative results except for slow pupillary reaction. Stiefler³³ reported a case in which coma lasted for three or four days and epileptiform seizures began four or five months after the acute attack. Neurologic examinations gave negative results; the ultimate outcome was not stated. Schneider⁶ made a brief report of a case in which there were retrobulbar neuritis, symptoms associated with degeneration of the cord tract and epileptiform seizures.

Neuritis and paresthesia are not uncommon following acute attacks but do not usually persist; in some cases, however, severe cord or neuritic symptoms have persisted for years. In Dorner's case,³⁴ in which an acute attack caused three days of coma, symptoms of cord disease developed seven months later, and two years

after exposure the patient was still suffering from weakness, numbness of the right hand, intention tremor, unequal pupils, nystagmus, patchy disturbances of sensation, astereognosis, adiadokocinesis and unequal reflexes, a positive Babinski reflex and ataxia. The lesions simulated multiple sclerosis or combined cord diseases, but they were excluded clinically. Potts's³⁵ patient, after four months of variable exposure, had an episode of acute intoxication in which acute symptoms including total external ophthalmoplegia appeared. Coma lasted for hours and the patient was somnolent for eleven days. Four months later he still had paralysis of the third nerve on the left side and weakness of the left arm. A similar case reported by Rutin³⁶ had as its sequel paralysis of the third nerve, persistent vertigo and past pointing. In one of Jansen's³⁷ cases neuritic phenomena developed six weeks after a single severe exposure and progressed steadily. The acute attack was accompanied by coma, mania and confusion lasting for ten hours. The patient's condition was greatly improved in forty-eight hours and he returned to work on the nineteenth day. Six weeks later, weakness, anorexia, headache, insomnia, peripheral nerve tenderness, irregular reflexes and ataxia were noted, and three and one-half years later recovery was not complete. Neurasthenia, areas of paresthesia and transitory neuritic pains persisted. In another case reported by Jansen³⁷ acute intoxication followed inhalation, with tremor, motor unrest and general convulsions. The patient left the hospital in eleven days but on the seventeenth day he complained of headache and tremor and a year later he was found to have facial weakness and deviation of the tongue for which no other cause could be found. Kalinowsky³⁸ reported a case in which an acute attack with multiple hemorrhages and thrombopenia was followed five weeks later by the appearance of painful median neuritis with paralysis of all the muscles supplied. This remained complete for at least one year.

From the cases cited it may be seen that the sequelae of acute gasoline intoxication can involve the higher centers, can be general or focal and can be limited in large part to the cord or to the peripheral nerves. This great variability in kind and in behavior, on the part of the sequelae, is in keeping with the variability in behavior displayed by both acute and chronic intoxication.

DIAGNOSIS

As a rule, acute poisoning offers little difficulty in diagnosis. There is a history of exposure, and the odor of gasoline usually clings to the clothes and skin, sometimes for days. If poisoning has been by ingestion, both vomitus and washings from lavage will have this smell for as long as four days. It will also be detected in the expired air for hours if exposure has been to high concentrations.

There is little that is characteristic about the patient's general appearance. In those who lie quiet, the vasomotor collapse, cold extremities and cyanosis may simulate shock. When muscular twitchings and jactitation

31. Cazeneuve, Tanon and Neveu: Frequent Cause of Automobile Accidents: Bulbar Intoxication by Gasoline Fumes and Carbon Monoxide, *Ann. d'hyg.* 11: 272, 1933, *Bull. Acad. de med.*, Paris 108: 1624, 1932.
Rutin³⁶
32. Floret: Recent Observations on Industrial Injury from Hydrocarbons, *Zentralbl. f. Gewerbehyg.* 3: 7, 1926.
33. Stiefler, G.: Benzine Poisoning Followed by Epilepsy: Case, *Wien. med. Wochenschr.* 78: 938, 1928.
34. Dorner, G.: Acute Benzine Poisoning Followed by Disease of the Spine, *Deutsche Ztschr. f. Nervenhe.* 54: 66, 1915.

35. Potts, C. S.: A Case of Probable Encephalitis Due to Inhalation of the Fumes of Gasoline, *J. Nerv. & Ment. Dis.* 42: 24, 1915.
36. Rutin, E.: Vertigo and Nystagmus Following Benzine Poisoning, *Acta otolaryng.* 23: 410, 1936.
37. Jansen, H. H.: Nervous Disorders (Sciatic Neuritis, Traumatic Epilepsy) Following Acute Benzine Poisoning, *Deutsche Ztschr. f. Nervenhe.* 144: 68, 1937.
38. Kalinowsky, L.: Berlin Gesellsch. f. Psych. u. Nervenkr., *Jahrb.* 1928; *abstr. Neurol. Zentralbl.*, 1928, p. 727.

or gross convulsions occur, epilepsy may be simulated. Around petroleum refineries and fields, where the men's clothing usually carries some odor of gasoline, differential diagnosis between acute poisoning by hydrogen sulfide and asphyxia from gasoline intoxication may offer difficulty, but early differentiation is immaterial, since treatment of the asphyxia caused by either agent is the same. Gasoline is frequently handled where internal combustion engines are operating, and consequently gasoline intoxication may be confused with coma and convulsions from carbon monoxide intoxication. The color of the skin and mucous membranes and the finding of carbon monoxide hemoglobin in the blood will serve to identify the latter condition.

Much greater difficulty in differential diagnosis occurs in cases of chronic poisoning and also in the allocation of responsibility for sequelae. Any one of the gastroenteric, cerebral or peripheral neuritic manifestations of chronic gasoline intoxication may occur in infectious, metabolic or degenerative disease, and for this reason great dependence must be placed on the history of exposure to gasoline. Personal inspection of working conditions may be necessary in order to establish the magnitude of the exposure, and the discovery of other cases with similar symptoms in workmen having similar exposure will be of considerable aid.

Sequelae usually do not follow chronic exposure; consequently amelioration of symptoms may be expected to follow cessation of exposure in chronic cases, and this may be the best expedient in establishing the diagnosis. Hysterical or psychoneurotic symptoms in a person with chronic exposure to gasoline should suggest the possibility of intoxication, and relief from these symptoms should follow soon after removal from exposure. In the reported cases in which early multiple sclerosis was simulated, temporal pallor, typical speech and emotional disturbances were absent.

In the interpretation of sequelae it is most useful to remember that severe sequelae have never been recorded except in cases of severe acute intoxication with a history of coma and often of convulsions.

PROGNOSIS

In most cases of acute intoxication there is recovery without serious after-effects; severe sequelae are uncommon. When exposure has been by inhalation the magnitude of exposure or absorption cannot be estimated and prognosis must be based on the patient's condition and clinical behavior. As in other intoxications, prolonged coma or the appearance of convulsions or epileptiform seizures is evidence of severe illness. More definite data are available for exposure by ingestion: In Siwe's⁷ series, 50 per cent of the cases in children were fatal. Nunn and Martin¹⁰ reported a mortality of 28 per cent in children after ingestion of gasoline, as compared with 9.2 per cent mortality following ingestion of kerosene. Patients fatally poisoned lived from two to eighteen hours, and all who died had pneumonia with cyanosis and respiratory difficulty from aspiration. Convulsions occurred in 2 of their fatal cases and in 2 nonfatal, while in one third of their nonfatal cases some aspiration pneumonia was present.

THERAPY

There is no specific treatment for intoxication with gasoline. Removal from exposure and general management are most important. If the material has been

taken by mouth, gastric lavage should be carried out as soon as feasible and should be the first treatment instituted, even though twenty-four or forty-eight hours have elapsed. Gasoline is absorbed only very slowly from the stomach, and washings have had a definite odor of it as long as four days after ingestion. In patients who are comatose, lavage will reduce the frequency of vomiting and will lessen the danger of aspiration of vomitus. If there is no enteritis or diarrhea, saline cathartics and enemas should be given to eliminate any of the material present in the lower part of the bowel.

Embarrassment of respiration is frequent; if breathing stops, artificial respiration should be carried out with oxygen and 6 or 8 per cent carbon dioxide. This treatment was given for eleven hours to a patient aged 2 years, 1 of the series reported by Nunn and Martin.¹⁰ Moreover, since most of the gasoline is excreted by way of the lungs, the course of the acute illness can be definitely shortened if adequate ventilation is secured by administering oxygen and carbon dioxide. Inhalation treatment has the further advantage of lessening the likelihood of pulmonary complications, such as atelectasis and pneumonia, by increasing the respiratory effort and expanding the lungs.

Sudden vomiting or failure of respiration is most likely to occur in the first three or four days of illness, and twenty-four hour nursing attendance is necessary during this time. Dangerous symptoms such as sudden apnea, convulsions or circulatory failure may come on without warning as long as three days after exposure, and the patient should be kept in the hospital under constant observation as long as any active symptoms are present. If evidences of peripheral vasomotor collapse appear, heat should be applied and therapy for the collapse instituted. Response to drugs in the involved vessels is poor and, when possible, physical methods of treatment should be employed. Cardiac stimulants may be necessary; epinephrine should not be used because of its tendency to cause pulmonary edema.

If exposure has been by inhalation, the patient should be removed immediately to fresh air, kept warm and placed in bed as soon as feasible; a cleansing bath should be given to remove any gasoline present on the skin. From this point, the general plan of management is essentially the same as that in poisoning from ingestion, except of course that lavage and cathartics are omitted.

SUMMARY

1. Gasoline is a mixture having a widely variable chemical composition, and poisoning from it produces a variable clinical syndrome. The most prominent symptoms and signs arise from the central nervous system and the gastroenteric tract.

2. The opportunities for exposure to gasoline constitute an increasingly important potential hazard in industry and to the community.

3. Pneumonitis, visceral congestion and hemorrhages are the most frequent pathologic changes.

4. Chronic intoxication from gasoline is rare.

5. Severe sequelae are uncommon and occur only after severe acute intoxication.

6. The history of exposure and estimation of its magnitude are of greatest importance in the diagnosis.

7. Therapy is general and supportive.

Eden Avenue.

Clinical Notes, Suggestions and New Instruments

WESTERN EQUINE ENCEPHALITIS OCCURRING AMONG HUMAN BEINGS IN KANSAS DURING THE SUMMER OF 1941

PRELIMINARY REPORT

JAMES A. WHEELER, M.D., NEWTON, KAN.

During the summer of 1940, Dr. Ketzelman and Dr. Grundaman¹ of Kansas State College made a collection of assassin bugs (*Microtonus purcis*) in a pasture where horses had died of western equine encephalitis. They found that 50 per cent of the collection were infected with virulent western equine virus. In 1941 collections were again made in different pastures with the same results.

The assassin bug is found mainly in pastures along rocks or ledges. It is a semitropical bug which is supposed to have migrated to North America but is now considered fairly common throughout the Middle West. This bug lives on blood from animals or man. It mates and hibernates after frost and lays its offspring along rodent nests so that the young may feed on the rodents until they are old enough to fly. After it can fly, which is in early May, it may then seek out animals in the pasture, especially horses. The bug feeds at night about once a week. It has been found around street lights and also in homes. The spread of horse encephalitis to human beings becomes apparent through this bug as well as other blood sucking vectors. We have been fairly certain that rodents were playing a role as a reservoir for the virus of western equine encephalitis. Last winter we passed the Lansing strain of virus back to the common rat. It is possible in horses that the assassin bug may light up the infection in the spring and then with the influx of mosquitoes the disease would be spread among both horses and man. With these facts and conjectures before us, we set out first to determine the percentage of western equine encephalitis infection among human beings in Kansas.

TESTS

For this investigation it was decided to obtain specimens of blood from reported cases of encephalitis occurring in man over the state. The Kansas State Board of Health consented to cooperate with us and we chose the serum neutralization test and guinea pigs as the test animals. These tests were to determine the negative and positive findings from the specimens of blood taken from the cases sent in by the Kansas State Board of Health. Four guinea pigs were used for each test. In any case in which there occurred an element of doubt, the tests were repeated. These tests were done by Dr. Lee Roderick, head of the Pathology Department, Kansas State College. No effort was made to test for the St. Louis strain of encephalitis virus. These specimens were taken routinely. The specimens came from a number of counties which included a wide area in Kansas. The final results showed that 50 per cent of the patients tested showed evidence of protection or antibodies against western equine virus.

Reference work in the West has shown that the virus of the St. Louis type of encephalitis is present in certain wild and domestic birds and mammals. Since the St. Louis strain has been passed successfully to the horse, it is thought that there may be more of this type of virus found among horses. It has been shown that horses from Colorado as well as from Montana and Washington possessed neutralizing antibodies for equine or St. Louis virus or both. Experimentally, horses were injected intracerebrally and inoculation was made of a proved strain of St. Louis virus. The resulting infection was

indistinguishable clinically from that caused by the western strain of equine encephalomyelitis virus.

Our clinical experience with human beings in this epidemic has shown in clearcut instances that the differential diagnosis on clinical grounds is difficult if not impossible; for example, a white boy aged 8 years in previous good health, whose parents had three weeks before the illness moved to a home near a small stream, had been bitten repeatedly and extensively by mosquitoes. He was sick for three or four days with high temperature. His parents did not call a doctor and it was not until he was up and about that they noticed he was dragging his left foot and he was then brought to the hospital. Examination showed a typical foot drop with anterior paralysis in the left leg, as often occurs in cases of anterior poliomyelitis. The spinal pressure was increased to 26 cm. The cell count was normal. The blood from this boy was tested as a routine measure by the serum neutralization test and to our surprise he gave a strong positive reaction to the western horse virus. Four other patients from our hospital who appeared to have clinical encephalitis had increased spinal pressure, the cell counts ranging from 75 to 100 lymphocytes. These patients were tested by the same method. The latter ones were negative to the equine western horse virus. They were not tested for the St. Louis virus. Of interest is the report of a health officer in Cherokee County, who reported that a man in western Kansas became ill with encephalitis and when he returned some distance to his home one of his horses became ill and died of encephalitis within a period of several weeks. The doctor suggested that the horse could have contracted the disease from this man. The man's blood was tested and found positive for the western equine encephalitis virus.

RESPONSIBILITY OF MOSQUITOES AND WOOD TICKS

Recently Hammon and his co-workers² have reported isolation of the western equine and St. Louis viruses from mosquitoes (*Culex tarsalis*) collected from areas in which cases of human encephalitis occurred. This evidence suggests the vector theory. The *Culex tarsalis* mosquito is common in Kansas. It is reported that nearly all the cases of equine encephalitis among horses occurred among those which were in the pastures and turned out to graze at night. Those which were kept in the barn at night, it was thought, had some protection. The reported clinical cases of both poliomyelitis and encephalitis have occurred in Kansas from week to week in 1940 and 1941 in a pattern that suggests a ratio population incidence. For example, if 5 cases were reported of either disease it would represent five counties—but 1 case to a county. It was a rare instance in a large county when 2 cases to a county were reported in the same week. In Kansas the incidence of poliomyelitis, encephalitis and equine encephalitis ceases abruptly with the fall frosts.

In the October 18 issue of *THE JOURNAL* it was reported³ that in Russia outbreaks of encephalitis occurred a number of years ago. The work among the Russian investigators has shown that wood ticks also played a part in the transmission of the disease. This particular work has probably been overlooked in the past in the light of some of our newer knowledge.

SUMMARY

1. The percentage of western equine encephalitis in reported clinical cases of encephalitis occurring in man in Kansas is being determined.
2. The serum neutralization test was used to determine positive and negative reaction of the patient's blood.
3. In Kansas 50 per cent positive reactions to equine encephalitis were found from the samples of blood taken from cases diagnosed as human encephalitis.

2. Hammon, W. McD.; Reeves, W. C.; Brookman, B.; Izumi, E. M., and Gjulin, C. M.: Isolation of the Viruses of Western Equine and St. Louis Encephalitis from *Culex Tarsalis* Mosquitoes, *Science* 91: 328-330, 1941.

3. New Developments in Knowledge of Encephalitis, editorial, J. A. M. A. 117: 1361 (Oct. 18) 1941.

This work was done in conjunction with Kansas State College, the Kansas State Board of Health and the Committee on Child Welfare of the Kansas Medical Society.

1. Ketzelman and Grundaman: Special bulletin report from Kansas State College, 1940.

4. The vector theory may prove to be a possible cause of the spread of both the western equine and the St. Louis virus.

5. The question of clinical diagnosis and classification of these diseases including poliomyelitis makes it doubtful, if not impossible, to make such a classification. The serum neutralization test should be used as one of the means to help classify virus infections occurring in human beings.

NOTE.—Further work will be undertaken with the St. Louis virus in the future. All negative reactions to western equine virus will be tested on Swiss mice for the St. Louis strain. These tests will be used as a routine measure next year by the state board of health in all cases of reported poliomyelitis and encephalitis. The purpose is to obtain further data on virus infections occurring in Kansas.

PHENOL-CAMPHOR FOR "ATHLETE'S FOOT"

EDWARD FRANCIS, M.D., WASHINGTON, D. C.
Medical Director (Retired), U. S. Public Health Service

I have used a combination of phenol and camphor with success for curing "athlete's foot." This preparation may be compounded as follows:

Melt U. S. P. phenol and measure out 3 cc. into a mortar; weigh 3 Gm. of U. S. P. camphor, break into small pieces and add to the melted phenol. Rub until the entire mass is liquefied. Transfer into a vial with a stopper suitable for use as a dauber. Keep stoppered when not in use. Experiments indicate that the ingredients may be mixed in the proportion of 3 parts phenol and 1 part camphor.

The mixture is nonirritating to the skin and may be painted between the toes several times a day, the small rubber stopper of the vial being used as a dauber. The sock may be replaced immediately without danger of corrosion. There is no discoloration of the clothing. Relief from itching is immediate. It should be pointed out, however, that the phenol-camphor preparation should not be applied to the wet skin, since water causes a breakdown of the preparation, with the result that it becomes caustic.

A trade preparation of phenol, camphor and iodine in proportions which are not stated is the only preparation containing phenol and camphor that I have seen specifically advocated for "athlete's foot." Since, however, there is no statement as to the proportions of the phenol and camphor and since it also has the objection of containing iodine which would stain the skin and clothing, I believe that the simpler phenol-camphor formula is preferable.

It seems remarkable that, with the exception of the trade preparation mentioned, none of the authorities of whom I am aware and who have recommended phenol and camphor for various diseases have pointed out that it may also be useful for curing "athlete's foot."

Thus, for example, the Dispensatory¹ of the United States of America contains the following formula: phenol, 30 parts; camphor, 60 parts; alcohol, 10 parts. This is recommended for the local treatment of erysipelas. Andrews² recommends the same formula for barber's itch. Remington's Practice of Pharmacy³ recommends this formula, but with substitution of liquid petrolatum for alcohol, as an antiseptic in dental practice. Swartz⁴ recommends phenol and camphor, of each 1 ounce (28.35 Gm.), and iodine 1 drachm (4 Gm.) for tinea favosa and tinea capitis, but he does not mention that formula under epidermophytosis, "athlete's foot."

Twenty-Fifth and E streets N.W.

1. The Dispensatory of the United States of America, ed. 22, Philadelphia, J. B. Lippincott Company, 1937, p. 830.

2. Andrews, G. C.: Diseases of the Skin for Practitioners and Students, Philadelphia, W. B. Saunders Company, 1938, p. 336.

3. Cook, E. F., and LaWall, C. H., and others: Remington's Practice of Pharmacy, ed. 8, Philadelphia, J. B. Lippincott Company, 1936, p. 554.

4. Swartz, J. H.: M. Clin. North America 19: 1627 (March) 1936.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

UNDER EDITORIAL SUPERVISION OF DRs. LEROY H. SLOAN, MARSHALL DAVISON AND FREDERICK STEIGMANN

THE THERAPY OF MENINGITIS

ARCHIBALD L. HOYNE, M.D.

CHICAGO

PROPHYLAXIS

In the presence of an existing epidemic effective measures that will lessen the likelihood of an attack of meningococcic meningitis are the establishment of free ventilation and the avoidance of overcrowding. Close association with some one already infected is necessary in order to contract the disease, since the survival time of the isolated organism is short. It has been shown¹ that the carrier rate could be reduced in dormitories from 29 per cent to 5 per cent by increasing the space between the beds from 9 inches to 3 feet. Fatigue has been found repeatedly to be a contributing factor in the development of the disease. A well balanced diet is important in any scheme of preventive medicine. An absence or deficiency of all the requirements mentioned are presumed to contribute to the outbreaks of epidemic meningitis which usually develop in time of war or when large numbers of recruits are mobilized.

Known carriers of meningococci seldom contract the disease because of their own immunity. Nevertheless, they are the chief means of conveying the infection to others. For this reason carriers² as well as patients with active disease should be isolated. The minimum quarantine period for a patient suffering from the disease is usually about two weeks. With the advent of intensive chemotherapy with the sulfonamide derivatives, meningococci are not usually isolated from nasopharyngeal cultures following recovery from the acute attack. Carriers who have been treated with these drugs no longer harbor the organism.³

Vaccines have been used with doubtful success for the purpose of active immunization, but Ferry⁴ has reported that a positive intracutaneous reaction caused by meningococcus toxin can be changed to negative in 66.8 per cent or more in those inoculated with three doses of the toxin.

Sometimes antimeningococcus serum or meningococcus antitoxin is administered intramuscularly for the purpose of passive immunization when there has been close contact with a person who has meningococcic meningitis. The real value of such treatment is questionable.

In all other forms of bacterial meningitis, with the exception of influenzal meningitis, some primary focus of infection is usually disclosed by a complete physical

1. Mutch, N.: Cerebro-spinal Meningitis, Guy's Hosp. Gaz. London 54: 282 (Oct. 5) 1940.

2. Silverthorne, Nelles; FitzGerald, J. G., and Fraser, D. T., with the technical assistance of Cameron, Colin: Studies on the Meningococcus and Meningococcus Infection, J. Pediat. 15: 491 (Oct.) 1939.

3. Fairbrother, R. W.: Cerebrospinal Meningitis: Use of Sulfonamide Derivatives in Prophylaxis, Brit. M. J. 2: 859 (Dec. 21) 1940.

4. Ferry, N. S., and Steele, A. H.: Active Immunization with Meningococcus Toxin, J. A. M. A. 104: 983 (March 23) 1935.

examination. There are no special systemic procedures which can be adopted, with exception of those for tuberculous meningitis (Mantoux, patch test, roentgen ray) which occurs as the result of overcrowded and insanitary living conditions where a tuberculous person has been dwelling.

HISTORY OF THERAPEUSIS

Prior to the twentieth century all forms of bacterial meningitis were nearly 100 per cent fatal. The first real progress in therapy came with the introduction of lumbar puncture by Quinke in 1891 and the development in 1906 of antisera by Kolle and Wassermann⁵ and also by Jochmann⁶ for the treatment of meningococcal meningitis. Soon afterward Flexner (1908)⁷ announced an improved serum which was first used on an extensive scale during the Akron, Ohio, epidemic of meningitis in 1907. For the next twenty-five years antimeningococcus horse serums were used on account of their avowed antibacterial action, and rarely if ever did any one suggest that they possessed antitoxic properties.

INTRASPINAL TREATMENT

These standard antimeningococcus serums were administered intrathecally scarcely without exception until Herrick⁸ in 1918 recommended large doses of antiserum intravenously when meningococcemia was apparent. Nevertheless, the intrathecal method was standard because of the contention that direct contact of the serum with the organisms in the spinal fluid was necessary to destroy the inciting cause of the disease. For this reason, if antimeningococcus serum was not injected intraspinally in the lumbar region it was likely to be given intracisternally or even intraventricularly. The mode of injection was nearly always by gravity after the withdrawal of spinal fluid in excess of the volume of serum that was to replace it.⁹

STANDARD ANTIMENINGOCOCCUS SERUMS

When meningococcal patients were treated with antiserum intrathecally the aim was to eradicate the organisms from the cerebrospinal fluid. To accomplish this purpose opinion differed regarding the frequency with which the serum should be given. Some prominent hospitals adopted a policy of administering antimeningococcus serum intraspinally "every six hours during the first few days," then every twelve hours and finally once in twenty-four hours. At Cook County Contagious Disease Hospital serum was never given more often than once in twenty-four hours. But, regardless of the intervals between intraspinal injections, this form of treatment was continued until laboratory reports specified that one or more cultures of the spinal fluid were negative. In addition, great weight was often attached to a high cell count, and sometimes for that reason alone serum treatment was continued even though no organisms could be demonstrated in the spinal fluid.

5. Kolle, Wilhelm, and Wassermann, August: *Versuche zur Gewinnung und Wertbestimmung eines Meningococcenserums*, Deutsche med. Wehnschr. 32: 609, 1906.

6. Jochmann, George: *Versuche zur Serodiagnostik und Serotherapie der Epidemischen Genickstarre*, Deutsche med. Wehnschr. 32: 788, 1906.

7. Flexner, W.: *An Analysis of Four Hundred Cases of Epidemic Meningitis Treated with the Antimeningitis Serum*, J. Exper. Med. 10: 690, 1908.

8. Herrick, W. W.: *Meningococcus Infection, Including Cerebrospinal Fever*, Oxford Medicine, 1932, vol. 5, part 1, p. 97.

9. Hoynes, A. L.: *Epidemic Meningitis*, Illinois M. J. 58: 265 (Oct.) 1930.

FATALITY RATES

There is no doubt that the production of a specific serum for the treatment of meningococcal meningitis exerted a decided influence on the mortality. As compared with preserum days, fatality rates were lowered 35 per cent or more. The statistics at Cook County Hospital show that for the nineteen year period¹⁰ (1915-1933), the average fatality rate was 50.6 per cent (1,815 patients). Fatality rates¹¹ of 60 per cent or more were common. In 1929 the state of Missouri reported 65.3 per cent and in 1930 the Ministry of Health¹² in England announced an appalling figure of 95.1 per cent. During the Detroit epidemic of 1928-1931 inclusive, in which there were 1,686 cases, the fatality rate was 50.5 per cent. At that time the therapeutic results were considered remarkably good.¹³ Chicago had an average fatality rate of 47.8 per cent for 4,028 cases of meningococcal meningitis in a twenty year period (1916-1935).¹⁴ During those years there were some clinicians in Germany who advised against the use of antisera for very young patients, claiming that better results could be secured merely by drainage. Moreover, there existed a general feeling that antimeningococcus serum was often lacking in efficiency.

REASONS OFFERED FOR FAILURE OF INTRASPINAL TREATMENT

Failure with the intrathecal treatment of meningococcal meningitis by antimeningococcus serum was often attributed to lack of agglutinating properties. But, practically, this conclusion was sometimes found to be erroneous because serums with little ability to agglutinate often gave good clinical results, whereas the reverse was not always true.

Besides the early standards of treatment which dictated that antiserum should be given intrathecally to patients with meningococcal meningitis, it has been felt quite generally that drainage of spinal fluid is always essential to avoid the "dangers" of intracranial pressure.

MENINGOCOCCUS ANTITOXIN

Until Ferry¹⁵ reported a soluble toxin (1931) and developed meningococcus antitoxin (1932), little consideration was given to the toxemia of meningococcal meningitis. In November 1933, I made the first clinical trial of Ferry's meningococcus antitoxin at the Cook County Contagious Disease Hospital. In the beginning, the new serum was given intraspinally and also to a lesser extent intravenously,¹⁶ according to a procedure followed sporadically since 1918.¹⁷ As the value of the antitoxin became well established, the amount of intraspinal serum was reduced, while at the same time larger quantities well diluted in 10 per cent dextrose solution were given intravenously. By the end of about one year

10. Hoynes, A. L.: *Meningococcal Meningitis: A New Form of Therapy*, J. A. M. A. 104: 980-983 (March 23) 1935.

11. Tripoli, C. J.: *Bacterial Meningitis: A Comparative Study of Various Therapeutic Measures*, J. A. M. A. 106: 175 (Jan. 18) 1936.

12. Annual Report, Chief Medical Officer, Ministry of Health, London, 1933, p. 13.

13. Gordon, J. E.: *Medical Report of the Herman Kiefer Hospital, Detroit, for the Five Years 1927-1931*, sec. XXII.

14. Hoynes, A. L.: *Meningitis*, J. Iowa M. Soc. 26: 549 (Oct.) 1934.

15. Ferry, N. S.; Norton, J. F., and Steele, A. H.: *Studies of the Properties of Bouillon Filtrates of the Meningococcus; Production of a Soluble Toxin*, J. Immunol. 21: 293 (Oct.) 1931.

16. Hoynes, A. L.: *Meningococcal Meningitis; Importance of Intravenous Therapy*, Illinois M. J. 68: 307 (Oct.) 1935.

17. Hoynes, A. L.; Arkin, H. S., and Sherman, M. J.: *Treatment of a Severe Case of Epidemic Meningitis by Combined Intravenous and Intraspinal Injections of Antimeningococcus Serum*, J. A. M. A. 72: 22 (Jan. 4) 1919.

intraspinal therapy was discontinued¹⁸ entirely and has not been used since 1935. In looking backward it seems interesting to recall that during a period of approximately thirty years, while continued efforts were being put forth to improve the effectiveness of antiserum, comparatively little attention was directed toward modes of administration other than the intrathecal route.

INTRAVENOUS THERAPY

When serum was administered exclusively by the intravenous¹⁹ route, it was found not merely that fatality rates were sharply reduced but that complications were few and recoveries often took place within a week from the time that treatment was begun. Moreover, opisthotonos and loculations of spinal fluid due to arachnoidal adhesions were not so frequently encountered. In addition, the patient was not subjected to the discomfort, pain and possible injury²⁰ resulting from numerous lumbar punctures and the introduction of an irritating substance into the intrathecal sac.

With the success of exclusive intravenous therapy firmly established, it was soon proved that meningococci disappeared from the cerebrospinal fluid much quicker than when serum was injected intraspinally. Furthermore, it also became apparent that frequent lumbar punctures for the purpose of drainage are not required. The old fear concerning dangers of intracranial pressure was dispelled and the view that no permanent relief from intracranial pressure was derived by frequent lumbar punctures has now gained wider acceptance. In patients suspected of meningococcemia either with or without evidence of meningitis, if a positive blood culture is obtained no lumbar puncture is necessary, although for a general estimate of the severity and for purposes of completeness it is likely that for some time to come lumbar puncture will be performed. It is preferable that no puncture be made. We have treated successfully more than 40 such patients without any lumbar puncture.²¹

THERAPEUTIC POSSIBILITIES

Until the advent of the sulfonamides it was rare that a patient survived any attack of bacterial meningitis other than the meningococcal type. Today the situation is far different. If tuberculous meningitis is excluded, it is justifiable to state that a patient suffering from any form of bacterial meningitis has at least a chance for recovery. And with chemotherapy the technic of treatment has been greatly simplified in the management of meningococcal meningitis. Antiserum is no longer required for the majority of such patients. If, however, the patient is suffering from a severe attack, possibly of a fulminating character²² with a profusion of petechiae or large hemorrhages of the skin, it is best to give at least one large dose (100,000 units) of Ferry's antitoxin or standard antimeningococcus serum (300 cc.) in about 600 cc. of 10 per cent dextrose in physiologic

solution of sodium chloride (0.85 per cent) to which approximately 1 cc. of a 1:1,000 solution of epinephrine hydrochloride has been added. This mixture should be given slowly, starting with 10 to 15 drops a minute and at body temperature, by the drip method. If it seems advisable, this procedure may be repeated. As much as 150,000 units (450 cc.) of Ferry's antitoxin has been given in one dose according to the procedure described, and more than 2,000 cc. has been administered intravenously to a single patient without any serious reaction even though a horse serum was introduced. Tests to reveal sensitivity to horse serum should be performed before the antitoxin is given. If the patient is known to be sensitive to horse serum he should be desensitized before antitoxin is given intravenously. The technic of desensitization by injection of graduated doses of the product is well known. I have expressed the opinion that the diluted antitoxin given intravenously according to my method is no more likely to cause a serious reaction than the undiluted serum or antitoxin given intraspinally.

ROUTINE PROCEDURE

1. The history is taken and a physical examination, urinalysis and blood count are made.
2. Blood is drawn for typing and culture.
3. Nose and throat swabs are taken for culture on Löffler's medium and blood agar plate.
4. A diagnostic puncture is made. If done, a Pandy test, a cell count and a direct smear, should be made, a blood agar plate should be inoculated and fluid should be sent to the laboratory for culture. Chemistry analyses should include one for total protein and for chlorides. A Wassermann test should be made and the pressure of the fluid should be noted.
5. Petechiae should be needled and a smear made of the exudate.
6. Therapy should then be started:
 - (a) Chemotherapy: The majority are given 5 Gm. intravenously of the appropriate sulfonamide and a blood level determination is made the following morning and chemotherapy continued orally.
 - (b) Ten per cent dextrose in physiologic solution of sodium chloride (0.85 per cent) 1,000 cc. is begun.
 - (c) A small blood transfusion, 250 cc., is given if the patient is in poor condition.
 - (d) If the patient requires more fluid, 5 per cent dextrose solution in physiologic solution of sodium chloride or dextrose-saline solution (2.5 per cent dextrose in 0.4 per cent saline) may be used.

These routines are not carried out implicitly as listed here. If the patient appears to have a meningococcal septicemia there is no need for spinal puncture, for the smear from the petechiae or blood culture will demonstrate the organism; chemotherapy is started, dehydration, acidosis and toxemia are being combated with dextrose and fluids; and by the time a reaction from these measures is expected the report of the blood culture will be known. If the response to therapy is poor and blood culture is positive, meningococcus antitoxin is given as outlined. If the blood culture is negative, then lumbar puncture is imperative for a diagnosis and should not be delayed. This procedure is not harmful to the patient, for if the meningitis is not of the meningococcal type the initial therapy is the same and lumbar puncture is merely diagnostic.

It must be remembered that after twelve hours of intensive chemotherapy spinal fluid cultures are often negative.

18 Hoyle, A. L. Treatment of Meningococcal Meningitis Without Intraspinal Therapy, *Nebraska M. J.* 21: 321 (Sept.) 1936.

19 Hoyle, A. L.: Intravenous Treatment of Meningococcal Meningitis with Meningococcus Antitoxin, *J. A. M. A.* 107: 478-481 (Aug. 15) 1936.

20 Lyon, G. M. Observations on the Treatment of Meningitis, *West Virginia M. J.* 28: 193 (May) 1932. Pease, C. N. Injuries to the Vertebral and Intervertebral Disks Following Lumbar Puncture, *Am. J. Dis. Child.* 40: 849-860 (April) 1935.

21 Hoyle, A. L. Epidemic Meningitis, *J. A. M. A.* 115: 1852-1855 (Nov. 30) 1940.

22 Hoyle, A. L. The Treatment of Meningococcal Infections, *Arch. Pediat.* 52: 164 (March) 1935.

CULTURES

Nose and throat cultures are taken on Löffler's medium for the purpose of noting the diphtheria organism. Blood agar plates are streaked to disclose hemolytic streptococci. The blood culture is made by placing 10 cc. of blood in 100 cc. of beef infusion broth. The spinal fluid used for culture is first centrifuged and about 1 cc. of the sediment is inoculated into a semi-solid medium consisting of a 0.2 to 0.5 per cent agar in veal infusion broth with ascitic fluid and salt added. The organism recovered from growth then must ferment maltose and dextrose and be a gram-negative diplococcus.

CHEMOTHERAPY²³

In any instance in which there is delay or doubt on the part of the laboratory in confirming or definitely establishing a bacteriologic diagnosis, it is generally advisable to begin treatment with sulfapyridine or sulfathiazole for the following reasons: They are effective in the treatment of meningococcic meningitis; they are the drugs of choice in pneumococcic meningitis; they are also capable of promoting recovery in cases of influenzal meningitis. In case the patient is comatose or possibly irrational, they may be administered intravenously as their respective sodium salts, and a proper blood level (6 to 8 mg. per hundred cubic centimeters) may be quickly established.

Patients with meningococcic meningitis may be treated throughout the course of their illness with sulfapyridine or sulfathiazole. If the patient is treated with sulfapyridine and can take the drug orally from the onset, it is customary to give an initial dose of 4 Gm. or less, depending on the severity of the disease, the weight and the age of the patient. This is then followed by 1 Gm. every four hours. For children a slightly smaller dose of the drug might be adequate, but close adherence to weight in measuring the dosage is not necessary. It is obligatory to keep a close check on the urine and, if there is evidence of blood, sulfapyridine should be stopped and sulfathiazole or sulfanilamide substituted. A similar change in medication should be instituted in case of nausea, vomiting or other evidence of toxicity which can be attributed to sulfapyridine. When these drugs are used it is mandatory that the patient have an adequate fluid intake.

These drugs may also be given rectally, as the sodium salts usually, in a perforated capsule or in a starch solution in the form of a retention enema. They also may be administered through a stomach tube.

If sulfanilamide is used it is usual to give one half the estimated total daily dose initially. This dose frequently ranges from 2 to 4 Gm. and is estimated on the basis of 0.06-0.12 Gm. per pound of body weight, depending on the severity of the disease. If the patient cannot take the drug by mouth, it may be given in 0.8 per cent solution subcutaneously. About 200 cc. of such solution may be given twice a day until oral administration is possible; then 1 Gm. every four hours usually suffices.

The Solutions Laboratory of the Cook County Hospital provides sodium sulfapyridine for intravenous use in 5 per cent solution of physiologic solution of sodium chloride instead of in distilled water, as usually advised. Flasks of 100 cc. will, therefore, contain about 5 Gm. of sodium sulfapyridine and are administered by the drip

method. A blood level for sulfapyridine should be determined on the second day of treatment and should be repeated at least every other day in order to gage the required dosage of the drug properly. As soon as possible, sulfapyridine should be given by mouth instead of by vein. Generally we have aimed to keep the level at 8 mg. per hundred cubic centimeters or higher. This cannot always be done, though we have sometimes attained a level as high as 25 mg. per hundred cubic centimeters for a few days. However, there seem to be definite variations in the manner in which patients respond to sulfapyridine. In some instances in which blood levels were high the patients did not survive, whereas others recovered even though concentrations of the drug in the blood fell to as low as 3 to 4 mg. per hundred cubic centimeters. It is not necessary to make frequent lumbar punctures merely for the purpose of determining spinal fluid levels, which may be no more than 70 or even 50 per cent of the blood levels.

For appropriate purposes, sulfathiazole appears to be effective with lower blood levels than those usually required with the other sulfonamides. Blood levels of from 4 to 5 mg. per hundred cubic centimeters have seemed to be adequate. Rashes, conjunctivitis and erythema nodosum may develop during the course of treatment but are not common. Gastric distress or mental confusion does not occur.

If intravenous administration is necessary or seems advisable, sodium sulfathiazole can be injected. The manner and size of the dosage is similar to that of the related drugs. A 5 per cent solution of sodium sulfathiazole in physiologic solution of sodium chloride is also supplied by the laboratory although it has been claimed that no other solvent but distilled water should ever be used. Sulfathiazole should never be given in dextrose nor in blood for transfusions. It should always be administered from a clean vessel and through sterile tubing not recently used for any other purpose. It has been stated that sulfathiazole does not pass readily into the cerebrospinal fluid. On the basis of our limited experience we doubt the correctness of that opinion.

After the acute symptoms have come under control the "sulfa" drugs are continued at a reduced dosage. The patient is usually off all medication in eight days but to continue medication at reduced dosage lessens the possibility of relapse or of complications.

*Sulfadiazine.*²⁴—This member of the sulfonamide group has been used for a great deal of clinical experimentation during the past year. It is claimed that sulfadiazine is less toxic than sulfapyridine or sulfathiazole and yet is as effective as either one of these drugs. Thus far sulfadiazine has not been obtainable for the treatment of meningitis in the Contagious Disease Department of Cook County Hospital. However, a report²⁵ of fourteen patients successfully treated with this drug has recently appeared. The use of this drug at present is in the experimental stage and should not be used as a routine until its place has been established.

MENINGITIS

Streptococcic Meningitis.—This responds well to sulfanilamide treatment. The procedures are the same as those described for meningococcic meningitis. Con-

24. Finland, Maxwell, Strauss, Elias, and Peterson, O. L.: Sulfadiazine: Therapeutic Evaluation and Toxic Effects on Four Hundred and Forty-Six Patients, J. A. M. A. 116: 2641-2647 (June 14) 1941.
25. Dingle, J. H.; Thomas, Lewis, and Morton, A. R.: The Treatment of Meningococcic Meningitis and Meningococcemia with Sulfadiazine, J. A. M. A. 116: 2666 (June 14) 1941.

23. With the rapid advance in chemotherapy, it is understood that the physician will appreciate the use of the "appropriate" sulfonamide and not allow his therapeutic technic to be harnessed to a single derivative.

trary to our experiences of years ago, we now anticipate that the patient with streptococcic meningitis will recover with proper treatment. Convalescent serum has been used as an adjunct to chemotherapy.

Pneumococcic Meningitis.—This was formerly almost as fatal as tuberculous meningitis. Within the past three years we have witnessed no less than 14 recoveries.²⁶ In one half this number specific type serum and also sulfanilamide or sulfapyridine were given. If serum is to be used, and generally such a decision is advisable, a culture from the spinal fluid is necessary and typing of the organism is required. The specific type rabbit serum in doses of from 200,000 to 400,000 units is administered intravenously. A total dose of more than 700,000 units has been given to a patient, and the same procedure is adopted as when a horse serum is being administered intravenously. Lately several patients with pneumococcic meningitis have been treated successfully without the use of specific serum. Among the latter group was a 6 year old girl with type III infection. During her first hospital day she received 8 Gm. of sodium sulfapyridine intravenously and after that 1 Gm. of sulfathiazole by mouth every four hours. She had one lumbar puncture for the purpose of diagnosis. Recovery was complete in one week.

It seems quite likely that eventually it will be found that chemotherapy without serum is as effective in the treatment of pneumococcic meningitis as similar therapy is for meningococcic meningitis. The dosage of the sulfonamides for pneumococcic meningitis may follow the customary guides for the drug used. Nevertheless, it has seemed advisable to lean toward massive doses of the drug at the beginning of treatment and to reduce the size of the dose only in accordance with the progress made by the patient. I have had blood levels as high as 25 mg. per hundred cubic centimeters for patients who recovered when sulfapyridine was used. Moreover, in these instances there was comparatively little gastric disturbance and no abnormal urinary conditions.

Influenzal Meningitis.—This responds also to chemotherapy, and on the basis of my own experience there appears to be an element of doubt as to whether better results are obtained by the combined use of antiserum and one of the sulfonamides than by administration of the drug alone. However, the antisera now available seem to be of value. Fothergill's anti-influenzal serum may be obtained from the Massachusetts State Board of Health. Alexander's Anti-Haemophilus Influenza Type B Serum (rabbit) is supplied commercially in 25 mg. vials. At least 50 to 100 mg. should be administered to a patient if this form of treatment is adopted in conjunction with chemotherapy. Although instructions accompanying the package recommend both intraspinal and intravenous injections, we have adhered to the exclusive intravenous route, employing the same technics as for other serums used in the treatment of meningitis. Alexander also advises daily lumbar punctures, a practice that we condemn. Usually our routine consists in large doses of sodium sulfapyridine intravenously after a lumbar puncture has permitted a laboratory diagnosis by examination of the spinal fluid. For the first two or three days it may seem advisable to give from 8 to 10 Gm. each twenty-four

hours in 4 to 5 Gm. doses about twelve hours apart. Occasionally the temperature of a patient with influenzal meningitis will remain almost stationary on a high plane of approximately 104 F. even though large doses of sulfapyridine are being given to the patient. Under such circumstances it is well to substitute sulfathiazole. This change of drug is sometimes very effective. In fact there are some who believe that sulfathiazole is always the drug of choice for the treatment of influenzal meningitis. Others have reported favorable results with sulfanilamide.

Often blood transfusion will prove to be a valuable adjunct in the treatment of any form of meningitis; for influenzal meningitis this is particularly true. It is always well, therefore, to take the necessary steps to secure appropriate blood donors as soon as a diagnosis of influenzal meningitis has been established. We believe that drainage of the cerebrospinal fluid is no more a necessary part of the treatment of influenzal meningitis than for any other form of meningitis. Moreover, since we have seen more than 16 patients with influenzal meningitis recover who were treated in accordance with these principles of therapy, our optimistic attitude seems justified.

Staphylococcic Meningitis.—This is less frequently encountered than any other of the meningitides previously mentioned. Fatality rates are likely to be higher. Recently it was stated that the total number of reported recoveries was but 9. In the Cook County Contagious Hospital there have been 2 recoveries. One patient was treated with sulfanilamide and the other with sulfathiazole. Both received blood transfusions. One lumbar puncture was made on the sulfathiazole-treated patient. The blood level varied from 3 to 4 mg. per hundred cubic centimeters during most of the treatment. Although these levels seem low compared to the requirements for other sulfonamides, apparently they are adequate.

Generally, it is advisable to give as an initial dose from 3 to 4 Gm. intravenously and follow this by 1 Gm. of sodium sulfathiazole every four hours. It is usually felt that as few doses as possible should be given intravenously because of the danger of thrombosing vessels. It is also possible to cause sloughs if the solution of sulfathiazole enters the tissues.

NURSING CARE

Patients suffering from bacterial meningitis should be isolated. Proper disinfection and disposal should be made of the secretions from the nose and throat, the urine, blood and spinal fluid.

For their protection and that of others, the physician and the nurse should not contact a patient with meningitis unless they are in complete good health, are not unduly fatigued and have no infection of the upper respiratory tract. Any grossly contaminated article should not be touched with the bare hands. In their care of the patient all attendants should wear gowns. Careful attention should be paid to washing the hands and avoiding the spray from the nose and throat of the patient. Masks are proper equipment for attendants and nurses inexperienced in the care of contagious diseases.

The room should be kept quiet and preferably at a constant temperature, and the eyes of the patient should be protected from strong light. When a bath is given,

26. Rhoads, P. S.; Hoyne, A. L.; Levin, Benjamin; Horswell, R. G.; Reals, W. H., and Fox, W. W.: Treatment of Pneumococcic Meningitis, J. A. M. A. 115: 917-922 (Sept. 14) 1940.

the water should be warm, and only a small area of the patient's body should be exposed at one time. The nurse must be unusually gentle in her handling of the patient.

Well padded side boards of beds or of cribs are used if necessary to protect the patient from injuring himself. If a nurse cannot be in constant attendance and side boards are insufficient, the opposite wrist and ankle are restrained by padded shackles.

Tepid sponges for reduction of temperature are given only as ordered by the physician and are rarely indicated.

It is the duty of the nurse to see that the patient maintains a normal intake of food and fluid but not to force either to the point of nausea. This is accomplished by giving frequent small feedings of any food desired and extra fluids between meals.

The nurse should observe and record accurately (a) symptoms of opisthotonos, rigidity of the neck, petechiae, nausea and vomiting, earache, headache, nasal discharge, disorders of the eyes or any unusual change, and (b) drugs given, noting the dosage and time taken, any emesis of medication with repetition of the dose or any untoward symptoms such as nausea or mental disturbance which may result. She should watch the intravenous administration to prevent the fluids from entering the subcutaneous tissues. If antitoxin is given, the solution should be warmed before and during administration. The nurse should watch carefully for signs of anaphylactic shock or serum sickness. It is, of course, her duty to assist the physician in the various procedures of drawing blood, making a lumbar puncture or giving intravenous therapy.

GENERAL RECOMMENDATIONS FOR THE TREATMENT OF BACTERIAL MENINGITIS WITH COMMENTS

1. A lumbar puncture should be made for diagnosis. This may not be necessary in early cases of meningococcemia.

2. No intraspinal therapy of any description should be given. As much harm as good may result from intrathecal treatment.

3. Frequent lumbar punctures for the purpose of drainage should be avoided. The old theory that intracranial pressure is permanently relieved by multiple withdrawals of cerebrospinal fluid is fallacious. The opposite effect is often produced.

4. When chemotherapy is resorted to maximum doses of the appropriate drug should be given at the beginning of the treatment, not at the end, at which time it is less effective.

5. If an animal serum is given intravenously, it should be well diluted in saline solution, not distilled water. If dextrose is chosen, the vehicle should still be saline solution, and epinephrine hydrochloride should always be added before the intravenous flow is started.

6. Opiates should not be administered to meningitis patients. Morphine may cause or increase existing edema of the brain. Comparatively few meningitis patients require sedatives.

The treatment of meningitis today need not be encumbered with the many difficulties which formerly attended it. Successful therapy depends now more on good judgment than on expert skill.

25 East Washington Street.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.
HOWARD A. CARTER, Secretary.

TELEX HEARING AID, MODEL 900, ACCEPTABLE

Manufacturer: Telex Products Company, 1645 Hennepin Avenue, Minneapolis.

The Telex Hearing Aid, Model 900, is said by the manufacturer to be designed for slight cases of deafness. Its use is advocated for individuals whose hearing loss is under 50 decibels. In the Council examination the device was found to consist of one microphone and amplifier unit, disk shaped, $2\frac{1}{2}$ inches in diameter by $\frac{3}{4}$ inch, weight 2.6 ounces; one crystal receiver, 1 inch diameter by $\frac{3}{8}$ inch, weight 0.2 ounce (without earpiece); one 30 volt W-20 B battery; one 1.5 volt 2-ES A battery; A and B battery assembly in leather case, $4\frac{1}{2}$ by $2\frac{1}{2}$ by $1\frac{1}{4}$ inches, weighing 11.8 ounces.

Following are results of the Council's investigation:

BATTERY DRAIN

The A battery current shown was 65 milliamperes independent of volume setting and sound. The B battery current was independent of volume setting. With no sound, it showed a current of 0.9 milliamperes and with sound a current varying from 0.5 to 0.8 milliamperes, depending on the sound intensity.

INTERNAL NOISE

The internal noise was not excessive. With a well fitted earpiece, there was no feed-back when the volume control was set for full volume.

ACOUSTICAL GAIN

The figures given in the accompanying table are typical of the acoustical gains as shown by audiometric measurements

Acoustical Gains

	128 256	512-2,049		4,096
		Min.	Max.	
At normal ear threshold set for full volume	nil	21	36	10 decibels

ARTICULATION

The usual articulation tests using hard of hearing subjects were made and showed satisfactory performance.

The Council voted to accept the Telex Hearing Aid, Model 900, for inclusion on its list of accepted devices.

ACOUSTICON, MODEL A-45, ACCEPTABLE

Manufacturer: Dictograph Sales Corporation, 580 Fifth Avenue, New York.

The Acousticon, Model A-45, was examined by the Council and was found to consist of the following items:

Microphone and Amplifier Unit, Model A-45, number 007647
A battery Acousticon No 26, 1.5 volts
B battery Acousticon No 41, 30 volts
B battery Acousticon No 39, 24 volts
B battery Acousticon No 37, 18 volts
B battery Acousticon No 35, 12 volts
1 crystal receiver
1 magnetic receiver
1 bone conduction receiver
1 leather battery case

Weights and dimensions of various parts are as follows:

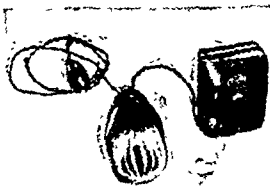
	Dimensions	Weight	Current Drain, Milliamperes
Microphone and Amplifier Unit Ovoid Shape	$2\frac{1}{2}$ " x 4" x 1"	4.7 Oz.	60-70
A-battery, No 26	$1\frac{1}{4}$ " Diam x $2\frac{3}{4}$ "	3.5 Oz.	1.1-2.2
B battery, No 41	$2\frac{3}{8}$ " x 3" x 1"	5.8 Oz.	1.0-1.6
B battery, No 39	$2\frac{3}{8}$ " x $2\frac{1}{2}$ " x 1"	4.8 Oz.	0.5-0.9
B battery, No 37	$2\frac{3}{8}$ " x $1\frac{1}{2}$ " x 1"	3.5 Oz.	0.25-0.4
B battery, No 35	$2\frac{3}{8}$ " x $1\frac{1}{4}$ " x 1"	2.4 Oz.	
Crystal receiver (without earpiece) 1 inch in diameter by $\frac{3}{16}$ inch			
Magnetic receiver (without ear mold) $\frac{3}{8}$ inch in diameter by $\frac{1}{2}$ inch			
Weight 0.35 ounce			
Bone conduction receiver, weight 0.64 ounce			

The A and B batteries are assembled by means of a spring clip connector and carried in the leather case.

The manufacturer recommends B-batteries as follows:

With bone conduction receiver.....24 and 30 volts
With magnetic receiver.....18 and 24 volts
With crystal receiver.....12 and 18 volts

With these combinations and a carefully fitted ear mold, the instrument could be turned up to full volume without feedback squeals. However, the 18 volt battery with the crystal receiver requires very careful fitting of the ear mold to meet this test. Noise due to rubbing or impact on the microphone case was rather high with the crystal receiver.



Acousticon, Model A-45

ACOUSTICAL GAIN

The following figures give the order of magnitude of the increase in sound intensity levels at the ear of the subject over those at the microphone under conditions of actual use as shown by audiometric measurements. They are not the same as the electrical amplification shown by measurements of electrical input and output.

Receiver	B Voltage	Volume	128	256-2,048	4,096 Cycles
Crystal	18	Full on	Nil	20 to 48	10 decibels
Magnetic	18	Full on	Nil	6 to 32	12 decibels

ARTICULATION

Syllable and sentence lists were used with hard of hearing subjects at a distance of 5 feet in a quiet room, using various combinations, with volume set for comfortable loudness. Satisfactory results were shown with crystal and magnetic receivers and with the bone conduction receiver.

The Council voted to accept the Acousticon, Model A-45, for inclusion on its list of accepted devices.

ALADDIN HEARING AID, MODEL NO. 7, ACCEPTABLE

Manufacturer: National Electronics, Inc., Schenectady, N. Y.

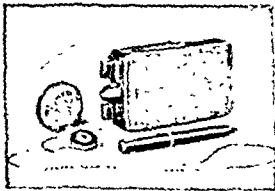
Distributor: Electronic Sales Company, 74 Chapel Street, Albany, N. Y.

The Aladdin Hearing Aid is a wearable vacuum tube instrument. The firm states that the unique feature of the device is the manner in which the amplifier and all the batteries are combined in a single assembly called the "Unipak."

In the Council examination the device was found to consist of the following items:

- One battery and amplifier unit.
- One microphone.
- One crystal receiver, 1 inch in diameter.
- One midget crystal receiver, 3/4 inch in diameter.

The A and B batteries and the amplifier are incorporated in a single unit in a leather covered metal case. This unit measures



Aladdin Hearing Aid Model No. 7

5 1/2 inches by 3 inches by 1 1/4 inches and weighs 436 Gm. (15.4 ounces). Volume control is effected by a single knob on the top of the unit. The microphone is a flat disk 1 3/4 inches in diameter, 3/8 inch thick, weighing 26 Gm. (0.92 ounce). Connectors are of the prong in hold type and well made.

The A battery is a 1 1/2 volt battery 1-ES. The B battery is an Aladdin No. EP-424, 27 1/2 volts.

Following are results of the Council's investigation:

Current Drain.—The A battery drain with control set for full volume was found to be 65-70 milliamperes. The B battery showed a current of 1.2 milliamperes.

Internal Noise.—The internal noise level was not excessive and the instrument was comparatively free from noise due to shock. There was very slight tendency to "feed back" squeals.

Acoustical Gain.—The following are typical of the increase in sound intensity levels at the ear of the subject with molded earpiece over that at the microphone as shown by audiometric measurements.

With Intensity at Microphone Approximately 40 Decibels Above Normal Ear Threshold

Measurements with a hard of hearing subject were uncertain because of inductive pickup of the audiometer signal, but they indicated that the gain was not materially less than those shown above.

With Normal Ear Threshold Intensity at Microphone

Vol. Setting	Receiver	128-256	Gain	
			512-2,048	4,096
Full on	1 inch receiver	None	11-30	10 decibels
	Fitted earpiece.....			
Full on	3/4 inch receiver....	None	11-29	4 decibels

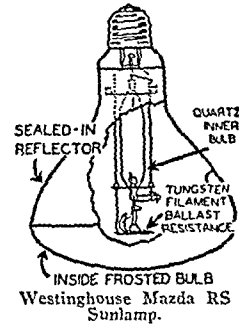
Articulation.—Syllable and sentence tests with hard of hearing subjects showed satisfactory performance.

The Council voted to accept the Aladdin Hearing Aid for inclusion on its list of accepted devices.

WESTINGHOUSE MAZDA RS SUNLAMP ACCEPTABLE

Manufacturer: Westinghouse Electric & Manufacturing Company, Lamp Division, Bloomfield, N. J.

The Westinghouse Mazda RS Sunlamp is described by the firm as a self-ballasting mercury vapor lamp equipped with its own built-in reflector. The reflecting surface, being deposited on the inside of the R-40 bulb, is protected from corrosion and dust; this fact, according to the firm, provides for a high maintenance of the output throughout the life of the lamp. The internal ballast consists of a tungsten filament resistance which operates at incandescence and radiates infra-red to provide comfortable warmth in the beam.



Following are data submitted by the firm:

Essential Technical Data

Watts	275 (combined mercury vapor arc and ballast)
Volts	110-125 (50-60 cycle A. C.)
Outer bulb designation.....	R-40
Material	Ultraviolet transmitting glass
Finish	Light inside frost-reflecting neck
Inner bulb	Quartz
Base	Medium screw
Maximum overall length.....	6 5/8 inches
Burning position	Any
Life	400 application
Erythema time	Approximately 5 minutes at 24 inches
Beam characteristics	40° divergence to 30% of axial intensity

The spectral energy distribution in the ultraviolet region produced by this lamp is as follows:

Manufacturer's Results		Council's Results	
Wavelength, Angstroms	Microwatts per CM ² at 30 Inches	Microwatts per CM ² at 24 Inches	
3,129	215.0	Lamp No. 23	210
3,022	76.0		214
2,967	28.0		98
2,925	3.2		50
2,894	4.7		
2,804	1.4		
2,753	0.1	Too low to measure	
Total 228.4 uW/cm ²		273	362 uW/cm ²

This total radiation output equals two to three times minimum requirements of the Council on Physical Therapy.

Fluoroscopic examination of the lamp by the Council confirmed the manufacturer's observations showing that the ultraviolet radiation of wavelengths shorter than 2,800 A is absent. Spectral measurements showed that in spectral quality and total intensity these lamps comply with the Council's requirements for acceptance as a "sunlamp."

The Council voted to accept the Westinghouse Mazda RS Sunlamp for inclusion on its list of accepted devices.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 6, 1941

PHYSIOLOGIC ANATOMY OF POLIOMYELITIS

When a ventral horn cell of the spinal cord is destroyed by the virus of poliomyelitis, all muscle fibers normally innervated by the affected neuron degenerate and ultimately disappear. It is not widely appreciated that muscles responsible for locomotor movements are made up of clusters of skeletal muscle fibers which receive innervation from single anterior horn cells. The ultimate physiologic unit of the reflex, therefore, is not the single muscle fiber but rather the group of muscle fibers controlled by one ventral horn cell; to designate such groups, Eccles and Sherrington¹ have introduced the convenient term "motor unit." They have found, after causing all sensory fibers from a given muscle to degenerate, that the motor nerve fibers to a skeletal muscle can be counted, and it was incidentally disclosed that the nerve supplying such a muscle actually contained more fibers near the muscle than at more proximal points. From this they concluded that individual axons must divide as they approach the muscle. Through teasing the nerve trunk as it ramifies in the muscle mass they confirmed this deduction, and they were able to demonstrate the existence of widespread bifurcation of the individual axons within the muscle substance.

Dean Clark,² in a paper which is now a classic in neuromuscular physiology, disclosed that individual nerve fibers passing to soleus and gastrocnemius muscles of cats supply an average of one to two hundred skeletal muscle fibers. After causing degeneration of all sensory fibers, Clark enumerated the remaining motor nerve fibers, and he also counted the number of muscle fibers in the muscle in question. For the soleus he obtained an innervation ratio of 1 to 120 and for the extensor longis digitorum 1 to 165. Similar innervation ratios are known to exist in man from the early

studies of Tergast,³ who, however, failed to make allowance in his calculations for sensory nerve fibers. It follows from this that, when one anterior horn cell succumbs to the virus, not less than one hundred muscle fibers undergo atrophy and die. From embryologic study one knows that the emergent nerve fibers from the spinal cord attach themselves to a closely knit group of muscle fibers. The Swedish pathologist Gunnar Wohlfart has observed in poliomyelitis⁴ and amyotrophic lateral sclerosis⁵ that degeneration of muscle fibers follows a pattern, not of muscle fibers, but rather of discrete muscle fasciculi. In examining sections of atrophic poliomyelitis muscles one frequently finds complete atrophy of all striated muscle fibers in a given fasciculus, while in the next fasciculus the majority of fibers appear healthy and intact. It is possible, therefore, that the muscle fasciculus may in many instances represent the motor unit. Sometimes, however, only half or a third of a fasciculus is affected, but in these instances the degenerating fibers are closely grouped and are not scattered indiscriminately through the fasciculus.

Denny-Brown, who has recently come to this country as professor of neurology at Harvard, points out in a recent paper with Pennybacker⁶ that in certain irritative neuromuscular diseases individual muscle fiber are affected in such a way as to give rise to fine twitching along the muscular surface. This is true "fibrillation" and results from abnormal irritability of individual muscle fibers; "fasciculation," on the other hand, involves large groups of fibers which tend to respond simultaneously and involuntarily. Fibrillation arises from disordered metabolism of the individual muscle fiber, fasciculation from irritative disorders of the ventral horn cell or its axons (e. g. in amyotrophic lateral sclerosis⁵).

In considering the physiologic anatomy of poliomyelitis and the therapeutic measures designed to benefit patients with poliomyelitis, it is thus highly important to visualize the motor unit; for it is the unit as a whole, rather than the individual fiber, that degenerates. Some units are larger and some small, and it is probable that the larger ventral horn cells control the larger units (Sherrington). Similarly some muscle fasciculi are large and some small, but one cannot yet generalize concerning the precise relation of the motor unit to the muscle fasciculi.

3. Tergast, P.: Ueber das Verhältniss von Nerve und Muskel, Arch. mikr. Anat. 9: 36, 1873.

4. Wohlfart, Gunnar: Ueber das Vorkommen verschiedener Arten von Muskelfasern in der Skelettmuskulatur des Menschen und einiger Säugetiere, Acta psychiat. et neurol., 1937, supp. 12, p. 1.

5. Wohlfart, Gunnar, and Swank, R. L.: Pathology of Amyotrophic Lateral Sclerosis: Fiber Analysis of the Ventral Roots and Pyramidal Tracts of the Spinal Cord, Arch. Neurol. & Psychiat. 46: 783 (Nov.) 1941.

6. Denny-Brown, D. E., and Pennybacker, J. B.: Fibrillation and Fasciculation in Voluntary Muscle, Brain 61: 311 (Sept.) 1938.

1. Eccles, J. C., and Sherrington, C. S.: Numbers and Contraction Values of Individual Motor Units Examined in Some Muscles of the Limb, Proc. Roy. Soc., s. B. London 106: 326 (June 2) 1930.

2. Clark, D. A.: Muscle Counts of Motor Units: A Study in Innervation Ratios, Am. J. Physiol. 96: 296 (Feb.) 1931.

These physiologic and anatomic considerations have a direct bearing on the therapeutic measures and practices recommended for the treatment of poliomyelitis. At one time it was believed that in early cases of poliomyelitis complete immobilization should be done as far as the affected muscles were concerned. Several years ago Sister Kenny in Australia recommended that free movement should be allowed and that affected muscles should be accorded the benefit of massage and passive movement instead of immobilization. It should be pointed out in this connection that there is no experimental evidence to support the contention that single muscle units might, as a result of appropriate manipulation, be encouraged to send their nerve fibers to muscle fibers which had been rendered atrophic by anterior horn cell degeneration. Normal units, however, become atrophic under conditions of immobilization, since muscle fibers are dependent for normal stimulation on their local reflexes (e.g., stretch reflexes) and immobilization arrests the flow of these proprioceptive impulses as effectively as it abolishes the flow of lymph. Massage and freedom of movement, therefore, are clearly indicated if all available motor units in paretic muscles are to retain their maximum physiologic capacity.

THE FOURTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Because industrial health is a necessity in defense production, the problems of maintenance of health in industry continue to grow in importance and extent. Many physicians are beginning to express interest in industrial appointments not only as a direct contribution to preparedness but because they sense values in industrial health which provide opportunity for interesting and beneficial professional careers. The program of the fourth annual Congress on Industrial Health, which is published in the Organization Section of this issue of *THE JOURNAL*, is designed to intensify this interest and to attract the attention of the profession as a whole to those aspects of industrial practice for which medical leadership and initiative are required. Industrial physicians cannot shoulder the responsibility alone; it is equally the concern of physicians in private general practice and in the specialties.

The training of physicians for satisfactory medical service in industry still is encountering obstacles through lack of information about what needs to be taught and available sources for obtaining teaching personnel and clinical facilities. Discussions of undergraduate and postgraduate industrial medical teaching will therefore occupy a prominent place in the program. Present

plans for training and placement need integration with the program of the newly organized machinery for assignment of medical personnel in industry, details of which will be presented by a representative of the Procurement and Assignment Service. Conservation of manpower is a primary industrial objective in war time, and plans which have been developed jointly by industry and a state medical association will be presented. Since it is illogical to train candidates for exacting skills who are unfitted physically or temperamentally for such work, job placement in industry is of exceptional current interest. The practical aspects of this important phase of medical service will be presented from the governmental, industrial and teaching points of view.

Special reports will be available for presentation during this congress. A joint statement prepared by the Council on Foods and Nutrition and the Council on Industrial Health evaluating vitamin rationing in industry will be presented. Dermatoses continue to occupy first place in claims for occupational disease compensation. A committee representing the Section on Dermatology and Syphilology will submit a report in which definitions of industrial dermatoses and primary skin irritants will be discussed, as well as the criteria for diagnosis of cutaneous afflictions of occupational origin. In a similar manner the Committee on Industrial Ophthalmology of the Section on Ophthalmology is preparing a preliminary statement about the bases for dependable appraisal of vision in industry and the related problems of correction. Lectures on important topics under the general heading of industrial medicine and traumatic surgery will be introduced as a powerful impetus toward improved standards of medical service in industry. These lectures will be a regular feature of all subsequent congresses.

Other important subjects for discussion include the question of medical service to small industry, with particular reference to free choice of physician for specific services, and the evaluation of technics and equipment for mass chest surveys, which are being applied more and more to supplement industrial physical examination programs. Special events include field trips to industrial medical departments for physicians interested in details of practical administration. A clinical program has been arranged in conjunction with the faculty of the University of Illinois College of Medicine.

This program illustrates once again that it is difficult to discover a field in either the basic or clinical medical sciences which has not contributed to or been affected by health problems in industry. The Council anticipates that each succeeding congress will reemphasize this important relationship.

Current Comment

ADDITIONAL APPROPRIATIONS ASKED FOR CONSTRUCTION OF HOSPITALS

On November 28 Representative Lanham of Texas, author of the original measure passed by Congress in June 1941 authorizing the expenditure of \$150,000,000 for community facilities in defense area communities, introduced a bill to increase this amount by another \$150,000,000. Washington reporters say that the bill will receive speedy passage by Congress. On December 1 there were on file with the Federal Works Agency in Washington over three thousand applications for federal funds, totaling nearly \$800,000,000, for the construction of schools, sewerage systems, hospitals and other community facilities authorized under the Lanham act. Over five hundred of these applications were for hospitals, health clinics and health centers, calling for the expenditure of \$140,000,000 in federal funds, which if approved would have left only \$10,000,000 for the numerous other community facilities provided for under the act. The Federal Works Agency has already approved one hundred and twenty-six of the hospital, health center and health clinic projects, which involve about \$21,000,000 in federal funds. Presidential approval, also necessary under the act before funds can be expended, has not been received for all of these. As of December 1, eighty of the one hundred and twenty-six applications had received presidential approval, with about \$12,000,000 in federal funds allocated to them. Officials of the Federal Works Agency state the \$150,000,000 appropriated under the original act is about exhausted, and possibly funds from the new bill will be necessary to take care of some of the forty-six projects already approved by FWA and now awaiting presidential signature.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

Elsewhere in this issue appears a new department of THE JOURNAL entitled "Procurement and Assignment Service for Physicians, Dentists and Veterinarians." Since this is the first time this department has appeared, the record covering the inception and establishment of this bureau is provided in detail, together with a complete list of the various committees which are to function in an advisory capacity to the board that directs the service. Major Sam F. Seeley has been detached from the United States Army Medical Department to serve as executive director in a full time capacity. A regional office has already been established in the headquarters of the American Medical Association to utilize the roster of physicians prepared by the American Medical Association. Similar rosters are in process of development in the headquarters of the American Dental Association and the American Veterinary Medical Association, which also are located in Chicago. The Committee on Medical Preparedness of the American Medical Association has been called

for a special session to take place in the near future, at which time means will be developed for cooperation of this committee in the various corps areas and of the state and county committees on medical preparedness with the Procurement and Assignment Service. Liaison officers have been appointed representing each one of the government services which utilize physicians and which will in the future procure its personnel through the Procurement and Assignment Service as far as possible. The technic proposed is experimental. There seems to be every indication, however, that it can function successfully. The complete cooperation of the medical profession of the country with this service will, of course, do much to aid its efficiency. In times like these, with the tremendous demands now being made on the medical profession, the desirability of attempting to assign every physician to the special function for which he is best suited and the necessity of utilizing every capacity of every physician to the utmost in the continuance of his civilian practice, in medical teaching, in industrial medicine, in the Army, Navy and Public Health Service or in any number of the many ways in which physicians now serve, cannot be questioned.

OVINE VENEREAL ULTRAVIRUS

A venereal infection of sheep due to an ultravirus has been described by Tunncliffe and Matischeck¹ of the Veterinary Research Laboratory, Montana State College. Venereal infections of sheep have been prevalent in certain areas of the United States for more than thirty years. One disease is popularly known as "pizzle rot," "foul sheath" or "venereal form of lip and leg ulceration." The infection is characterized by ulceration and scab formation, the lesions being most common at the preputial orifice or on the lips of the vulva. In the male the penis may be involved, severe balanitis usually resulting in phimosis or paraphimosis. The balanoposthitis is usually regarded by veterinarians as one of the many gangrenous conditions of domestic animals produced by *Actinomyces necrophorus*. In eleven infected ewes and rams recently examined in the Montana State Laboratory, *necrophorus* bacteria were not found. In aerobic and anaerobic cultures bacteria were not noted constantly present in all lesions, with the exception of a small gram-negative bacillus, which proved to be noninfective if swabbed into the scarified venereal surfaces of normal sheep. Experimental transmission, however, was readily accomplished by similar application of bacteria-free filtrates of diseased tissues. Typical lesions were produced by these filtrates, and the disease again transmitted by filtrates from the filtrate-produced cases. The size, antigenicity and chemotherapy of the ultravirus presumably present in these filtrates and its pathogenicity for other animal species have not yet been reported by the Montana investigators. Evidently, however, they have discovered promising material for basic virus research, with numerous suggestive clinical applications.

1. Tunncliffe, E. A., and Matischeck, P. H.: Paper 155, Agric. Expt. Sta., Montana State College, Science 91:253 (Sci. 1) 1941.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

The Procurement and Assignment Service was approved by the President on October 30. The creation of this service resulted from a recommendation of the Subcommittee on Medical Education of the Health and Medical Committee to the Health and Medical Committee on March 31. Following a meeting of the Health and Medical Committee on April 28, this recommendation was transmitted by the Health and Medical Committee to the Committee on Medical Preparedness of the American Medical Association for its consideration. The Committee on Medical Preparedness presented this recommendation to the House of Delegates of the American Medical Association at its meeting in Cleveland, June 2 to 5. At this meeting the House of Delegates adopted the following resolution:

WHEREAS, The President of the United States has declared that we are in a state of unlimited emergency, and the Surgeon General of the United States Army requested the American Medical Association in June 1940 at the annual session to aid in the procurement of the necessary personnel for an army of 1,500,000 men; and

WHEREAS, The American Medical Association established a Committee on Medical Preparedness which has now on hand the records of approximately 150,000 physicians as well as a statement as to their training, experience and specialization; and

WHEREAS, The sudden entrance of the United States into a war might immediately require the services not only of the physicians already called to duty but of a very considerable additional number, and

WHEREAS, Neither the American Medical Association nor any other civilian agency has the responsibility or the authority for the selection of those physicians who would be necessary for immediate duty and who would be called for civilian practice into service with the military agencies; therefore be it

Resolved, That the United States government be urged to plan and arrange immediately for the establishment of a central authority with representatives of the civilian medical profession to be known as the Procurement and Assignment Agency for physicians for the Army, Navy and Public Health Service and for the civilian and industrial needs of the nation

This recommendation is made to avoid or minimize confusion and the inevitable delay which would result from the lack of such an arrangement. It is further recommended by the Committee on Medical Preparedness that, if this resolution is approved by the House of Delegates, a copy of it be sent to the President of the United States, the Secretary of War, the Secretary of the Navy, the Chairman of the Senate and House Committees on Military Affairs, the Administrator of the Federal Security Agency, the Surgeon General of the United States Army, the Surgeon General of the United States Navy, the Surgeon General of the United States Public Health Service, the Adjutant General of the Army, and the Health and Medical Committee.

The Health and Medical Committee voted to adopt these recommendations in principle and forward them to the Coordinator, with the suggestion that he consult with the Secretary of War and the Secretary of the Navy and that matters concerning details of organization remain contingent on the action taken by those officials.

Mr. McNutt has held preliminary discussion with the appropriate people in Washington and has asked that the Health and Medical Committee proceed with the drafting of the legislation necessary for translating the objectives of the resolution into effective action.

This resolution was presented to the Health and Medical Committee at its meeting on July 2, 1941. The committee reviewed the resolution and voted to adopt it in principle and forward it to the Coordinator with the suggestion that he consult with the Secretary of War and the Secretary of Navy and that all matters concerning details of organization remain contingent on action taken by those officials. In August the Committee on Medical Preparedness of the American

Medical Association met in Washington with representatives of various governmental agencies to consider the proposal.

This resulted in a meeting of the Health and Medical Committee on October 22 to initiate the development of a Procurement and Assignment Service. At that meeting the following were present:

Health and Medical Committee.—Dr. Irvin Abell, Chairman; Surgeon General James C. Magee, U. S. Army; Admiral Ross T. McIntire, U. S. Navy; Surgeon General Thomas Parran, U. S. Public Health Service; Dr. Alfred N. Richards, Office of Scientific Research and Development; Dr. James A. Crabtree, Executive Secretary.

Liaison Officer.—Major Sam F. Seeley, M. C., U. S. Army.

Administrator and Staff.—Mr. Paul V. McNutt, Administrator; Mr. Watson B. Miller, Assistant Administrator; Mr. Leonard J. Calhoun, Assistant General Counsel; Mr. Perrin H. Lowrey, Office of General Counsel.

Consultants.—Dr. George Baehr, Office of Civilian Defense; Col. Leonard G. Rowntree, Selective Service; Dr. Frank H. Lahey, American Medical Association; Dr. Olin West, American Medical Association; Dr. Morris Fishbein, American Medical Association; Dr. Rosco G. Leland, American Medical Association; Dr. Fred W. Rankin, American Medical Association; Dr. Harvey B. Stone, American Medical Association; Dr. C. Willard Camalier, Subcommittee on Dentistry; Dr. Gerald T. Timmons, American Dental Association; Dr. C. Sidney Burwell, Subcommittee on Medical Education; Dr. Nathaniel W. Faxon, Subcommittee on Hospitals; Col. George F. Lull, M. C., U. S. Army; Dr. Hugo Mella, Veterans Administration; Dr. Verne K. Harvey, Civil Service Commission; Mr. George St. J. Perrott, National Institute of Health.

At this meeting, the Health and Medical Committee named a Commission to Draft a Program for a Procurement and Assignment Service, the members being Dr. Frank H. Lahey (Chairman), Dr. C. Sidney Burwell, Dr. Harvey B. Stone, Dr. Clarence D. Selby, Dr. Morris Fishbein and Dr. C. Willard Camalier.

At a meeting of the commission on October 28 the following report was made:

When the 1918 armistice was signed, the United States Army had 3,673,888 men in service and 31,501 Medical Corps officers. Should the United States Army be expanded for any reason in the near future to any similar size, at least an equivalent number of physicians would be required.

Today the United States Army includes approximately 90,000 officers, 6,000 nurses and 1,480,000 enlisted men. Of the 90,000 officers approximately 14,000 are in the medical department and of the soldiers approximately 109,000 are in the medical department. The officers in the medical department include 11,465 physicians in the Medical Corps, of whom 8,983 are reserve officers, 1,250 regular officers and 1,232 National Guard officers. Calculated on a basis of six medical officers per thousand men there is at present a shortage of about 1,473 medical officers. The Army Medical Department also includes 2,300 dentists in the Dental Corps and 660 veterinarians in the Veterinary Corps.

Should the Army not be greatly expanded within the next year but continue with a training program of about the present scope, a maximum of approximately 3,200 replacements would be required each year for the next five years during the period of the Selective Service Act. It is estimated that approximately two thirds of the physicians now in service would elect to remain for the period of the emergency. If, however, it should not be possible to retain these men in service, the number needed for replacement would be considerably expanded.

The Army has a Medical Reserve Corps which includes some physicians who can be called for various types of military service. In calling

men to service it is customary to call them from the Reserve Corps. Moreover, there are now organized a considerable number of sponsored units including general hospitals, field hospitals and smaller units. Today the so-called sponsored units include sixty-eight general hospitals, thirty evacuation hospitals and twenty-five surgical hospitals. These units are not yet an active part of the military establishment and the physicians associated with such units, if they are members of the Reserve Corps, may be called into service at any time. Then if these units are ordered into service, those physicians who are affiliated may be detached from the service to which they are assigned and returned to the sponsored unit.

THE NAVY

The needs of the United States Navy have been satisfied by a considerable expansion of the regular Navy Medical Service. The Navy demands about 6.5 physicians for every thousand of its personnel. At present enough physicians are enrolled to meet its needs, so that a new increment of approximately 100 physicians is required now as replacements. It seems likely that by July 1942 with the expansion of the Navy another 700 physicians would be required. To meet this need the Navy has a pool of 1,000 in its Reserve Corps.

The Navy also requires from 12 to 15 dentists each year. There are now 650 dentists on active duty, of whom 300 are dental reserves. The Navy has, moreover, approximately 1,500 dentists on reserve status.

THE PUBLIC HEALTH SERVICE

The United States Public Health Service requires about 35 new officers each year to meet its normal requirements for replacements. However, in view of the present expanded activities, the next year would require approximately 100 interns in public health service institutions. It also requires about 10 dentists each year in the form of new assignments and for replacements. At present the Public Health Service is recruiting physicians for defense areas, for service in extracantonment zones and for defense industries. Moreover, state health departments to meet new expansions require about 150 additional physicians.

The United States Public Health Service also maintains a reserve. Most of its men, however, are active in various state or local health positions. The removal of these men from such positions would, of course, require replacement.

THE UNITED STATES VETERANS BUREAU

The United States Veterans Bureau now has about 1,800 physicians in full time positions. About 500 of the physicians in the Veterans Bureau hold positions in the United States Army Medical Reserve Corps, as do also a considerable number of men in the field of public health either with local or with state organizations. In order to bring the Medical Reserve Corps of the Army into a position in which it could be counted as an active asset, all men holding reserve positions who are otherwise occupied in essential functions should resign their commissions from the United States Army Medical Reserve Corps.

THE CIVIL SERVICE COMMISSION

The Civil Service Commission provides many federal agencies with lists of physicians to meet their needs. Such agencies as the Indian Service, the Bureau of Mines, the Coast Guard Service, the Department of Pensions and many other groups employ physicians from the Civil Service lists. Altogether such agencies employ about 2,500 doctors. Each year they employ about 400 new men for replacements or for new positions. For the present fiscal year they lack 250 physicians to meet their requirements.

An evaluation of the total number of physicians immediately required to meet various governmental needs during the next year would indicate between 2,000 and 3,000 unless there should be a sudden expansion of the United States Army.

PRESENT CONDITIONS

At present even the United States Army Medical Department may have difficulty in securing physicians for its needs.

When the Selective Service age was changed from 35 to 28 the possibility of securing any considerable number of medical men by Selective Service was so greatly diminished as almost to eliminate the Selective Service as a source for securing physicians. The average age of graduation from medical school today is approximately 28 years. Following graduation the young physician must have an internship of at least one year in a recognized hospital. Many of the civilian hospitals of the country are already short of the number of interns that they require to carry on their service efficiently. Many of the large hospitals which employ considerable numbers of interns have established economy in the number of interns by reducing the number by one third to one half.

The medical schools of the United States graduate each year approximately 5,000 physicians. The number of physicians graduated is just about what is needed to supply the hospitals capable of extending the education of the young physician by an internship with the interns that they require. Many smaller hospitals having less than one hundred beds, which is the limit placed on an acceptable internship by the Council on Medical Education and Hospitals of the American Medical Association, find it difficult if not impossible to secure interns at this time. Indeed, such hospitals have become accustomed to paying fairly good salaries to young men, who then take a second or third year of training in the smaller hospitals. By the time the physician has completed his internship he is in many instances married. The estimates would indicate from one fourth to one half of the total number as being with dependents by the time they have finished the intern period. Moreover, among the physicians, as among the public generally, in view of the high physical standards maintained by the United States Army and Navy, slightly over one half of the young physicians are able to qualify physically for commissions in the Army or Navy Medical Corps. Indeed, it has been suggested that a different standard be maintained for physicians particularly as relates to minor defects of vision which are correctable with eyeglasses or to some similar defect in order to enable such physicians to be commissioned in the Medical Corps. In many instances these men

would be quite capable of giving good medical service without the likelihood that they would eventually become a dependent of the government.

In addition to the demands made on the medical profession by the services already mentioned, there is the necessity for some service related to civilian defense, to the Selective Service and to expanded war industries. Thus many of the large construction projects of both the Army and the Navy demand physicians who are being employed as contract physicians and surgeons for the period of the construction.

Moreover, in order to provide for a continuous supply of men with specialized training, approximately 800 to 1,000 of the young men who have completed one or two years of internship must take an additional three to five years of residency or specialistic training to qualify before the various boards which examine and certify men in the specialties.

SUMMARY

The coordination of the various demands made on the medical, dental and veterinary personnel with the available supply and the most efficient utilization of this professional personnel would seem to demand the establishment of a special agency capable of recording the qualified personnel available, of assigning such personnel or encouraging voluntary enlistment of such personnel in the services where most needed and of giving every qualified physician, dentist and veterinarian an opportunity to enroll himself in some service demanded by the national need.

CONCLUSION

For this reason a special committee, appointed by the Health and Medical Committee of the Office of Defense Health and Welfare Services has made the following recommendations:

1. That an Office of Procurement and Assignment of physicians, dentists, and veterinarians be established.

2. That this office shall function as part of the Office of Defense Health and Welfare Services, which is itself a part of the Office of Emergency Management.

3. The function of this office shall be to procure personnel from existing qualified members of the professions concerned. The office shall receive from various governmental and other agencies requests for medical, dental and veterinary personnel. These requests shall indicate the number of men desired, the time during which they must be secured, the qualifications and limitations placed on such personnel. The office must then by appropriate mechanism arrange to secure lists of professional personnel available to meet these requirements, utilizing such existing rosters, public and private, as it may find acceptable. It shall also be authorized to approach such professional personnel as is considered to be available and to use suitable means to stimulate voluntary enrollment.

4. The Office of Procurement and Assignment shall consist of a board of five members, one of whom shall be chairman. This board shall be chosen from members of the medical, dental or veterinary professions and shall not include any salaried employees of the federal government. This board shall function without salary but shall be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of their duties.

5. The board shall appoint an executive secretary who shall serve also as executive officer and who shall be without vote in its deliberations and decisions. He shall serve as a full time employee with salary (to be determined) and with such assistants as the board may determine necessary to carry out its functions.

6. The board shall be authorized to establish such advisory committees and subcommittees as may be necessary. These committees shall represent the various interests concerned, such as medical, dental and veterinary schools, hospitals, Negro physicians and women physicians. Members of such committees shall serve without salary but shall be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of their duties.

7. The board shall also be authorized to request various agencies of the government using medical, dental or veterinary personnel to appoint liaison officers and representatives to advise the board in carrying out its functions.

8. In carrying out its functions the board shall cooperate with such agencies as are now established under the Selective Service as well as other federal agencies.

On October 30 a letter was directed to the President by the Director of Defense Health and Welfare Services, as follows:

The coordination of the various demands made on the medical, dental and veterinary personnel of the nation and the most efficient utilization of this personnel would seem to require the establishment of a special agency capable of recording the qualified personnel available, of assigning or encouraging enlistment of such personnel in the services where most needed and of giving every qualified physician, dentist and veterinarian an opportunity to enroll himself in some service demanded by the national need.

For these reasons I wish to propose that there be established as one of the principal subdivisions of the Office of Defense Health and Welfare Services an office for the procurement and assignment of physicians, dentists and veterinarians. This office would be known as the Procurement and Assignment Agency.

The functions of the agency would be (1) to receive from various governmental and other agencies requests for medical, dental and veterinary personnel, (2) to secure and maintain lists of professional personnel available, showing detailed qualifications of such personnel, and (3) to utilize all suitable means to stimulate voluntary enrollment, having due regard for the overall public health needs of the nation, including those of governmental agencies and civilian institutions.

The agency would consist of a board of five members, one of whom would serve as chairman. The board would serve without salary but would be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of its duties.

A full time executive officer (with salary to be determined) would be appointed, together with such assistants as would be required to carry out the functions of the Agency.

I recommend that the board be composed of Dr. Frank Lahey, chairman, Dr. James Paullin, Dr. Harvey B. Stone, Dr. Harold S. Diehl and Dr. C. Willard Camalier.

This communication is addressed to you in accordance with provisions contained in paragraph 4 of the Executive Order, dated Sept. 3, 1941, "Establishing the Office of Defense Health and Welfare Services in the Executive Office of the President and Defining Its Functions and Duties," to the effect that the President shall approve the establishment of the principal subdivisions of the Office of Defense Health and Welfare Services and the appointment of the heads thereof.

In the event you approve the establishment of the Procurement and Assignment Agency, together with the board membership as recommended, I shall proceed immediately with the creation of the agency and will prepare budget estimates in the amount of approximately \$50,000 for submission to the Budget Bureau to cover the costs of the agency.

In addition I would propose to instruct the Agency to draft legislation which may be necessary to submit to the Congress providing for the involuntary recruitment of medical, dental and veterinary personnel, in the event the exigencies of the national emergency appear to require it.

PAUL V. McNUTT.

The President wrote Approved on this letter. The initial meeting of the Board of the Procurement and Assignment Service was held on November 6 in Washington. A subsequent meeting was held on November 26, and at these meetings the organization was developed as follows:

BOARD OF PROCUREMENT AND ASSIGNMENT SERVICE

Dr. Frank H. Lahey, Chairman, President, American Medical Association, Boston.

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Dr. Cassius Way, New York.

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Mr. J. J. Bloomfield, Sanitary Engineer, U. S. Public Health Service, National Institute of Health, Bethesda, Md.

Dr. John F. Fulton, Yale University School of Medicine, New Haven, Conn.

Dr. Richard M. Hewitt, Mayo Clinic, Rochester, Minn.

Dr. Ira V. Hiscock, Yale University School of Medicine, New Haven, Conn.

Dr. Sanford V. Larkey, Division of Medical Sciences, National Research Council, Washington, D. C.

Dr. Robert N. Nye, Managing Editor, New England Journal of Medicine, Boston.

Consultants will be appointed to the Service, as required.

The following liaison officers have been designated by the federal agencies concerned:

Capt. Paul A. Paden, M. C., U. S. Army, Washington, D. C.

Capt. P. M. Allbright, Medical Officers Reserve Section, U. S. Navy, Washington, D. C.

Asst. Surg. Gen. Paul M. Stewart, U. S. Public Health Service, Washington, D. C.

Dr. Hugo Mella, Veterans Administration, Washington, D. C.

Lieut. Col. C. G. Parker Jr., Selective Service System, Washington, D. C.

Dr. Verne K. Harvey, U. S. Civil Service Commission, Washington, D. C.

Dr. George Baehr, Medical Director, Office of Civilian Defense, Washington, D. C.

Dr. Edwin F. Daily, Director, Division of Health Services, Children's Bureau, Washington, D. C.

DEFINITION OF PURPOSE

The primary objective of the Procurement and Assignment Service is to maintain a complete list of all physicians, dentists and veterinarians of the entire country with detailed information as to age, physical condition, professional qualifications and availability for service in the various military, civil and industrial agencies of the country. This information is to be made available to all these groups who desire to enlist the services of these professional men.

PLAN OF OPERATION

The existing facilities of the American Medical Association, American Dental Association and American Veterinary Medical Association have been graciously offered to the Procurement and Assignment Service. A regional office has been set up in Chicago in which questionnaires, rosters and punch card data pertaining to all physicians, dentists and veterinarians will be maintained and kept up to date. The Committees on Medical Preparedness of the American Medical Association, American Dental Association and American Veterinary Medical Association will be utilized in the conduct of surveys, dissemination of information to the professions and the recruitment of personnel as requisitioned by various governmental agencies. The Procurement and Assignment Service will maintain a central office in Washington, D. C. The regional office in Chicago will maintain the rosters. A board in each of the nine corps areas will consist of representatives of medical education, hospitals, the Medical Preparedness Committee of the American Medical Association and two civilian practitioners in each corps area. These boards will act in an advisory capacity with the view of assuring adequate professional care of the civilian and industrial populations within the area and in the selection of those professional people within the area who can be spared for service with the armed forces. They will function through the existing state, district and county committees on medical preparedness. The medical, dental and veterinary medical needs will be considered by committees of each of the respective professions.

After a complete survey has been made and the availability of personnel has been determined, the central office will then be prepared to furnish to all requisitioning agencies rosters of those available for duty within their organizations. The result of questionnaires clearly indicates that large numbers of physicians, dentists and veterinarians will voluntarily make themselves available for positions which will guarantee adequate professional care to the civil, industrial and military requirements. It is planned that in the very near future every physician, dentist and veterinarian will receive a questionnaire from the Procurement and Assignment Service on which he will be asked to designate his preference regarding the capacity in which he desires to contribute his maximal efforts to the successful culmination of the present national emergency. Alternate preferences will be stated and every professional man will be certified by the Procurement and Assignment Service as having volunteered his services.

From rosters maintained as a result of the foregoing information, requisitioning agencies will be furnished the names of those available as the needs arise, should expansion of the defense program require additional professional personnel. This plan is designed primarily to assure adequate personnel for the armed services and to avoid unwarranted dislocation of professional people from their present localities.

ASSIGNMENT

Rosters maintained by the Procurement and Assignment Service will be made available to all agencies requiring professional personnel. These agencies will submit requests to the Procurement and Assignment Service indicating the number and qualifications of men desired and the time during which they must be procured. These agencies will then be furnished lists of men who have been determined to meet their needs. Notification will be transmitted to these people by the Procurement and Assignment Service or by the agency to which the lists have been furnished.

This service will be available to all federal, state, industrial and civil agencies of the country. The following agencies have been represented in the initial meetings of the Procurement and Assignment Service: Army, Navy, U. S. Public Health Service, Veterans Administration, Civil Service, Office of Civilian Defense, Selective Service, Children's Bureau and Bureau of Animal Industry.

The industrial needs will be determined by the Committee on Industrial Health and Medicine.

Federal, state and county health department needs will be determined by the Committee on Public Health.

The need for women physicians will be determined by the Committee on Women Physicians.

The need for Negro physicians will be determined by the Committee on Negro Health.

The Committee on Hospitals will consider the needs of all hospitals with a view to maintaining an adequate number of staff members, interns, residents and instructors.

The Committee on Medical Education will consider the needs of medical schools from the standpoint of teaching, staffs, research facilities, and so on.

The dental and veterinary committees will survey their respective professions with a view of assuring proper disposition of members of these professions throughout the country.

DISSEMINATION OF INFORMATION

The Committee on Information is charged with the responsibility of disseminating information to all physicians, dentists and veterinarians in order that they may be kept informed of the progress of their Procurement and Assignment Service. This will be done by all available means of communication; viz. national and state medical journals, who will be kept informed of the progress. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has offered its services in the form of a section on the Procurement and Assignment Service, where progress of the service will be reported and a current list of the needs of the various services will be maintained, together with a report on the progress of the assignment of personnel to meet these needs.

The Procurement and Assignment Service has begun to function and the following status of requisitioning agencies has been determined:

Army.—The present allotment by the War Department of Medical Department officers as of October 31 is: Medical Corps 12,938, Dental Corps 2,911, Veterinary Corps 689. As of October 31 there were on active duty: Medical Corps 11,439, Dental Corps 2,905, Veterinary Corps 720. This leaves a shortage of "filler" replacements, as follows: Medical Corps 1,499, Dental Corps 6, Veterinary Corps none. At the present time there are sufficient Dental Corps Reserve Officers and Veterinary Corps officers to fill the present and the immediate anticipated needs. The Medical

Reserve Corps has been practically depleted, although there are many medical reserve officers who have not been called to active duty. These reserve officers are engaged in the completion of internships, are employed in positions essential to defense efforts, in a civilian capacity, or are enrolled in affiliated units which would be called to active duty in case of war. When a sufficient number has entered the service on active duty to meet the "filler" requirements, additional commissions will result in the release of those officers now on active duty who have undergone their period of training, but whose release is dependent on replacement.

On October 27 publication of an Army regulation pertaining to commissioning of officers in the Army provided for the commissioning of officers in the Medical Corps in ranks from First Lieutenant to Colonel on authority of the Secretary of War. Commissions will not be granted hereafter in the Reserve Corps but will be in the "Army of the United States." Available reserve corps officers will be utilized before those commissioned in the "Army of the United States." This regulation provides that officers commissioned in the Army of the United States will be called to immediate active duty and will be discharged from their commissions not later than six months after termination of the national emergency. This provision of immediate active duty does not apply to commissions in the Army of the United States of junior and senior medical students, twelve month interns or officers associated with affiliated units. Hereafter appointments of third and fourth year medical students will be in the Medical Administrative Corps of the Army of the United States, and appointments after graduation from medical school will be in the Medical Corps of the Army of the United States. It should be emphasized that these officers will not be called to active duty until they have completed twelve months of internship.

At the present time, with an army of 1,700,000, the Medical Department has been fortunate in that large numbers of senior officers with World War experience who have continued their services since that time are available for assignment to important positions. As a result there are no vacancies at the present time in the grades of Colonel or Lieutenant Colonel and very few vacancies in the grade of Major or Captain. This, therefore, under the present strength of the Army, calls for a large number of commissions in the Medical Corps in the junior grades. It must be borne in mind, however, that should an expansion take place large numbers of officers in senior as well as junior grades will be required. If expansion occurs, those officers now on duty who are qualified for higher grades will be promoted and officers commissioned in the Army of the United States will be commissioned in the grade that will fill the requirements.

Navy.—Medical Corps: By June 1942 the Navy will require 700 additional medical officers. It is anticipated that these needs will be filled by the commission of those completing internship and those now in the Reserve. In the Dental Corps at present there is an adequate number in the Reserve Corps to meet the anticipated needs of the near future.

Veterans Administration.—Physicians: At present there is an acute shortage of 100 physicians. The immediate need is for 100 associate physicians with

Civil Service qualifications in the following fields: tuberculosis, 2; neuropsychiatry, 40; general medicine and surgery, 40; eye, ear, nose and throat, 5; roentgenology, 3; pathology, 4; urology, 2; orthopedics, 2; cardiology, 1; chest surgery, 1. For the fiscal year ending June 30, 1942 the total number of physicians required under present needs is 210. Twelve dentists are needed for this period. For the fiscal year 1943, 300 additional physicians will be required.

The needs of the Veterans Administration will increase in direct proportion to the number of patients transferred from the active military forces to the Veterans Administration during the present defense program. At the present time patients who are disabled in the military service are transferred to the Veterans Administration. As the defense program progresses, greater numbers will be transferred. The expansion will be followed carefully by the Procurement and Assignment Service, and the needs of the Veterans Administration will be transmitted to the Procurement and Assignment Service as they arise.

Public Health.—Physicians: One hundred medical officers are needed prior to Jan. 1, 1942 and approximately 150 more by June 30, 1942. About 10 new dental officers will be required by the next calendar year.

Civil Service.—Physicians: Approximately 500 physicians will be required prior to July 1, 1942. The needs for dental and veterinary personnel will be reported to the Procurement and Assignment Service as they arise.

The needs for the Office of Civilian Defense, the Selective Service and the state and local health departments parallel the needs of the civil populations, and satisfactory functioning of these agencies will depend a great deal on the appropriate allocation of professional personnel to the civil population.

Under authority of an executive order dated September 3, establishing the Office of Defense Health and Welfare Services, that office was charged with the duty to "serve as the center for the coordination of health and welfare services made available by the departments and agencies of the federal government and other agencies, public and private, to meet the needs of state and local communities arising from the defense program and take necessary steps to secure the cooperation of the appropriate federal departments and agencies relative thereto." The Procurement and Assignment Service, under the Office of Defense Health and Welfare Services, has been charged with the coordination of medical, dental and veterinary personnel for the armed services with the view of assuring adequate care of the civil and industrial population. This program represents a concerted effort on the part of every physician, dentist and veterinarian in the country, and the success of the service is assured because of their indicated willingness to serve in the national emergency. With the knowledge that the Procurement and Assignment Service will coordinate the demands of the defense program so as to minimize disruption of the present care of the civil population and the dislocation of professional people from their present localities, it is anticipated that enrolment in the various fields of endeavor by professional men will be excessive and that the carrying out of the duties of the Procurement and Assignment Service will be facilitated by the unselfish cooperation of all concerned.

ADDITIONAL LIST OF PRIORITIES AMONG HEALTH SUPPLIES

A letter from Donald M. Nelson, Director of Priorities, Office of Production Management, Washington, D. C., calls attention to preference rating order P-29, together with amendment 1 (dated October 7) to this order, which provides for a rating of A-10 for manufacturers of the health supplies listed in the order. Through this assistance, physicians should be able to secure necessary supplies and equipment from their usual sources, if their suppliers have taken advantage of the assistance made available through this order. Twelve important additions to the list of health supplies to the manufacturer of which A-10 preference rating is available have been made.

The original list, issued with the announcement of the Health Supplies Rating Plan on August 25 and published in *THE JOURNAL*, September 27, page 1103, contained fourteen classifications. Several of these have been extended to include more items, in addition to the new classifications set up in the amendment to Preference Rating Order P-29.

The complete health supplies list, which now covers twenty-five classifications for medical, surgical, dental and veterinarian use, follows. Those classifications marked with an asterisk are new, and items in italics are extensions of classifications set up in the original list.

- * 1. Acoustical aids.
- 2. Anesthesia apparatus and supplies.
- * 3. Atomizers (medical use only).
- 4. Biologicals, antitoxins, serums, *sterile ampules and intravenous solutions.*
- 5. Clinical thermometers.
- 6. Diagnostic equipment and *supplies.*
- * 7. Hospital carts, racks and charts.
- 8. Hypodermic syringes and needles.
- * 9. Infant incubators.
- 10. Instruments.
- * 11. Invalid chairs, walkers and crutches.
- 12. Laboratory equipment and supplies.
- 13. Medicinal chemicals (limited to medical use only).
- 14. Operating room *supplies* and equipment.
- * 15. Ophthalmic products and instruments.
- * 16. Physical therapy equipment (limited to medical use only).
- * 17. Respirators, resuscitators and iron lungs.
- 18. Rubber hospital sundries.
- * 19. Sickroom furniture, equipment and supplies.
- * 20. Splints and fracture equipment.
- 21. Sterilizers, *blanket and solution warmers.*
- 22. Surgical dressings and adhesive plasters.
- * 23. Surgical and orthopedic appliances (including artificial limbs and arms).
- * 24. Sutures and suture needles.
- 25. X-ray equipment and supplies.

A manufacturer of any of these items wishing to avail himself of the assistance offered by this plan should make written application to the Health Supplies Section, Office of Production Management, Washington, D. C., for form PD-79, "Report of Requirements for Scarce Materials," and at the same time file a complete catalogue showing as nearly as possible all the finished articles he manufactures.

Amendment 1 to Preference Rating Order P-29

Paragraph (a) (2) is hereby amended to read as follows:

(2) "Health Supplies" means such of the following items as are to be produced by the producer for medical, surgical, dental or veterinarian uses:

- 1. Acoustic aids.
 - 2. Anesthesia apparatus and supplies.
 - 3. Atomizers (medical use only).
 - 4. Biologicals, antitoxins, serums, sterile ampules and intravenous solutions.
 - 5. Clinical thermometers.
 - 6. Diagnostic equipment and supplies.
 - 7. Hospital carts, racks and charts.
 - 8. Hypodermic syringes and needles.
 - 9. Infant incubators.
 - 10. Instruments.
 - 11. Invalid chairs, walkers and crutches.
 - 12. Laboratory equipment and supplies.
 - 13. Medicinal chemicals (limited to medical use only).
 - 14. Operating room supplies and equipment.
 - 15. Ophthalmic products and instruments.
 - 16. Physical therapy equipment (limited to medical use only).
 - 17. Respirators, resuscitators and iron lungs.
 - 18. Rubber hospital sundries.
 - 19. Sickroom furniture, equipment and supplies.
 - 20. Splints and fracture equipment.
 - 21. Sterilizers, blanket and solution warmers.
 - 22. Surgical dressings and adhesive plasters.
 - 23. Surgical and orthopedic appliances (including artificial limbs and arms).
 - 24. Sutures and suture needles.
 - 25. X-ray equipment and supplies
- and such additional items as may be added to the foregoing from time to time by order of the Director of Priorities.

The manufacturers of research laboratory supplies and equipment have also been granted assistance through preference rating order P-43, to which reference was made in *THE JOURNAL*, October 18, page 1365.

PROGRESS IN CIVILIAN DEFENSE ORGANIZATION

Emergency medical service for civilian defense is developing according to plans laid down by the Medical Division of the Office of Civilian Defense in its Bulletin No. 1 (*THE JOURNAL*, August 30, p. 783). A roll call made during Civilian Defense Week, November 10-16, showed that nineteen states and the District of Columbia had appointed state chiefs of emergency medical service up to that date. A total of four hundred and seventy-eight city and county governments had local chiefs of emergency medical service. Massachusetts, New York, Pennsylvania and Vermont led in these appointments. Thirty states have designated chairmen of the health and medical committees of their state defense councils; in some cases these men are also the state chiefs of emergency medical service. Following the recommendations of the Medical Division, three hundred and eighty-three hospitals have organized emergency medical field units and twenty-four such units have been organized outside of hospitals. Seventy-three of the units are located in New York State.

The Volunteer Nurse's Aide training program was reported to be under way in sixty-one Red Cross chapters, with one hundred and seventy-seven hospitals participating. The roll call showed that three hundred and forty-three aides had completed the course and had already given more than eight thousand hours of service.

MEDICAL AID TO RUSSIA AND NORWAY

The Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, has approved sending medical and surgical aid to Russia in collaboration with established relief agencies, it was announced by Mrs. Rogers Balcom, executive chairman. In response to special appeals, quantities of sulfapyridine tablets and stainless steel Michel forceps are being assembled by the committee for use in Russian hospitals. During the past week a special request was received from the Free Norwegians in Iceland for two thousand, three hundred and thirty-six assorted instruments, 10 pounds of sulfapyridine powder for sprinkling on wounds and twenty-four physicians' first aid sets. These supplies will be used to help equip four mobile units of fifty bed capacity.

HELIUM PRODUCTION INCREASED

The helium plant operated by the U. S. Bureau of Mines at Amarillo, Texas, stepped up the production of helium last year to more than 16½ million cubic feet of this noninflammable gas, of which 15 million cubic feet was used by the government for defense and military purposes. During the last fiscal year more wells have been driven and the plant has been expanded, which it is expected will increase the capacity of helium production to about 36 million cubic feet annually. This, according to the U. S. Department of the Interior, is the only helium plant in the world.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

ABRAMSON, Milton, Captain, Minneapolis, Fort Leonard Wood, Mo
BAKER, Joseph Harrison, Captain, LaCrosse, Kan, Corps Area Service Command Station Hospital, Fort Riley, Kan
BASSETT, Wallace Herman, 1st Lieut, Texarkana, Ark, Corps Area Service Command Station Hospital, Camp J. T. Robinson Ark
COWAN, George Morterud, 1st Lieut, Knoxville, Iowa, Corps Area Service Command Induction Station, Fort Leavenworth, Kan
DALTON, Marvin Lewis, 1st Lieut, Brinkley, Ark, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark
DISHONGH, Howard Allen, 1st Lieut, Little Rock, Ark, Camp J. T. Robinson, Ark
FRICK, John Paul, Lieut Colonel, Kansas City, Mo, Fort Leonard Wood, Mo
HALPERIN, Philip Harold, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Leavenworth, Kan
HANCHEY, Carl Cecil, 1st Lieut, DeQueen, Ark, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark
KEIL, Marcus Augustine, 1st Lieut, Thompson, Iowa, Corps Area Service Command Induction Station, Camp J. T. Robinson, Ark
KIPEN, Charles Samuel, 1st Lieut, St. Louis, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark
LARSON, Ralph Hertrich, 1st Lieut, Tenney, Minn, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo
LEUTHER, Peter Alfred, 1st Lieut, Mankato, Minn, Fort Riley, Kan
MARKS, Roger Weston, 1st Lieut, St. Paul, Fort Riley, Kan
MEAD, Louis Czosnyka, Major, Minneapolis, Cal Aero Training Corporation, Grand Central Air Terminal, Glendale, Calif
NEUFELD, Robert John, 1st Lieut, Davenport, Iowa, Rock Island Arsenal, Rock Island, Ill
PETERS, Claude Frederick, 1st Lieut, Benton, Ark, 217th General Hospital, Fort Riley, Kan

NINTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Ninth Corps Area, which comprises the states of Washington, Montana, Oregon, Nevada, Utah, California and Idaho:

ANDERSON, Murl O, Captain, Hardin, Mont, Third Division, Fort Lewis, Wash
ANDREWS, Harry H., 1st Lieut, Sumner, Wash, Fort Stevens, Ore
BAISINGER, Leo P., 1st Lieut, Bakersfield, Calif, Fort Ord, Calif
BARBOUR, Nathan P., Lieut Colonel, Lockeford, Calif, Camp Cooke, Lompoc, Calif
BOLTON, Leslie T., Lieut Colonel, Reno, Nev, Fort Winfield Scott, Calif
BURLESON, Ferris C., 1st Lieut, San Jose, Calif, Station Hospital, Camp Roberts, Calif
CAWLEY, John J., 1st Lieut, Bakersfield, Calif, Office of Corps Area Surgeon pending assignment to Hawaiian Department
CHOY, Frank Jue, 1st Lieut, San Francisco, Camp Grant, Ill
DEINE, Edward J., 1st Lieut, Coquille, Ore, Fort McDowell, Calif
DITTES, Albert G., 1st Lieut, Glendale, Calif, 808th Engineer Battalion (Aviation), March Field, Calif
EFFRON, Morton, 1st Lieut, Los Angeles, Camp Callan, Calif
FAGLESTON, John R., 1st Lieut, Santa Monica, Calif, Station Hospital, Fort Ord, Calif
FRIBORG, Arnold L., 1st Lieut, Brief, Wash, Station Hospital, Fort Lewis, Wash
GALLAGHER, Hiram, Captain, San Anselmo, Calif, Camp Seeley, Calif
JOHNSON, George H., 1st Lieut, Vancouver, Wash, Fort Lawton, Wash
JONAS, Carl H., 1st Lieut, Medical Lake, Wash, Camp Haan, Calif
KIMURA, Jiro, 1st Lieut, Berkeley, Calif, Medical Replacement Center, Camp Grant, Ill
LLI, Gilbert 1st Lieut, Los Angeles, 58th Quartermaster Regiment, Stockton, Calif
LEVITT, Louis, 1st Lieut, Worden, Mont, 183d Field Artillery, Fort Francis F. Warren, Wyo
LFWF, Irving A., 1st Lieut, Los Angeles, Camp Roberts, Calif
LOMAS, Max I., 1st Lieut, Los Angeles, 3d Coast Artillery, Fort McArthur, Calif
MARKS, Roland T., Captain, Hillsborough, Calif, Fort Winfield Scott, Calif

REYNOLDS, Garland Alexander, 1st Lieut, Cape Girardeau, Mo, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
SCHMIDT, John Henry, 1st Lieut, Cheyenne, Wyo, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo
SCORSE, Sidney William, 1st Lieut, Webb City, Mo, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
SIGURDSSON, Jon Olafur Stefan, 1st Lieut, West Fargo, N. D., Corps Area Service Command Station Hospital, Fort Snelling, Minn
SILVERBERG, Charles, 1st Lieut, Richmond Heights, Mo, Fort Leonard Wood, Mo
SIMPSON, Ronald Albert, 1st Lieut, Hutchinson, Kan, Corps Area Service Command Station Hospital, Fort Des Moines, Iowa
SMAZAL, Stanley Francis, 1st Lieut, Davenport, Iowa, Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo
STAUFFER, Harry Beach, Major, Jefferson City, Mo, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark
STOCKER, William James, 1st Lieut, Fort Smith, Ark, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Ark
WASHBURN, Arthur Mansfield, Lieut Col, Little Rock, Ark, Fort Jackson, S. C.
WICKS, William Jeremiah, 1st Lieut, Iowa City, Corps Area Service Command Station Hospital, Fort Riley, Kan
WINDMILLER, Myrl Eugene, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Riley, Kan

Orders Revoked

HEDEMARK, Homer Harold, Captain, Thief River Falls, Minn, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo

Relieved from Active Duty

GINSBERG, William, Major, St. Paul, Fort Snelling, Minn
SPIRY, Arthur William, 1st Lieut, Moberg, S. D., Fort Riley, Kan
STICKLER, Ralph O., 1st Lieut, Kirksville, Mo, Jefferson Barracks, Mo
THOMPSON, Carl Oliver, 1st Lieut, Hendricks, Minn, Fort Snelling, Minn
VAN VALKENBURG, John Donald, 1st Lieut, Floodwood, Minn, Fort Snelling, Minn
YELLEN, Benjamin Louis, 1st Lieut, Wadsworth, Kan, Fort Riley, Kan

MEYER, Vincent S., 1st Lieut, Los Altos, Calif, Camp Sibert, Calif
MIYAUCHI, Yukio, 1st Lieut, Santa Maria, Calif, Camp Grant, Ill
NEWTON, Abram M., Major, Pocatello, Idaho, Station Hospital, Fort Lewis, Wash
O'CONNOR, Michael J., 1st Lieut, San Mateo, Calif, Camp Callan, Calif
ROSSITER, Stanford B., 1st Lieut, San Francisco, Camp Seeley, Calif
RUDEN, S. J., 1st Lieut, Eureka, Calif, Fort Worden, Wash
SAWYER, Harry W., Jr., 1st Lieut, Fallon, Nev, 216th Const Artillery, Camp Haan, Calif
SHEAFE, Earle V., Lieut Colonel, Oakland, Calif, Station Hospital, Fort Ord, Calif
SHUMAN, John W., Lieut Colonel, Santa Monica, Calif, Fort Ord, Calif
SOUTH, Francis Floyd, Major, Portland, Ore, Fort Stevens, Ore
STOCKTON, Christopher, 1st Lieut, Bakersfield, Calif, Third Army Corps, Presidio of Monterey, Calif
ST. PIERRE, Roderick G., Captain, Portland, Ore, Fort Stevens, Ore
STROUSE, Carl D., 1st Lieut, Hollywood, Calif, 41st Division, Fort Lewis, Wash
TALBOT, John C., 1st Lieut, Berkeley, Calif, Induction Station, Portland Recruiting District, Portland, Ore
TOMA, John J., 1st Lieut, Los Angeles, Fort Rosecrans, Calif
WARD, Henry C., 1st Lieut, Long Beach, Calif, Station Hospital, Camp Roberts, Calif
WAITS, Floyd J., 1st Lieut, Sebastopol, Calif, Camp Roberts, Calif
WILCON, Charles F., Major, Los Angeles, Camp San Luis Obispo, Calif
WILSON, Kent R., Captain, Santa Barbara, Calif, Camp Roberts, Calif

Orders Revoked

ARNOWITZ, Isaac, 1st Lieut, San Francisco
CHAMPOUX, Clement G., 1st Lieut, Selah, Wash, Camp Clatsop, Ore
DAGGETT, Gilbert G., 1st Lieut, Madera, Calif, Fort Worden, Wash
LDFLSON, Zandy C., 1st Lieut, Portland, Ore
FREDRICKSON, Clyde H., Lieut Col, Missoula, Mont
RUKKE, Raymond V., 1st Lieut, Monterey, Calif
SCHADE, George H., 1st Lieut, Camp Haan, Calif

Relieved from Active Duty

PETERFY, Richard A., Captain, Camp San Luis Obispo, Calif
PORTER, James L., 1st Lieut, Camp McQuaide, Calif

Resignation

ONFILI, Thomas J., 1st Lieut, Fort Rosecrans, Calif

ORDERED TO FOREIGN DUTY

GRFLN, Arthur Morton, 1st Lieut, Station Dispensary, Allbrook Field, Canal Zone
HTRMFS, Richard Lawrence, 1st Lieut, Ponce Puerto Rico, Flight Surgeon's Office, Borinquen Field, Puerto Rico
JACOB, Samuel Sprick, III, Captain, Corozal, Canal Zone

MANGINELLI, Samuel Thomas, 1st Lieut, 70th Medical Battalion, Corozal, Canal Zone
MOSIMAN, William Dillon, 1st Lieut, Morton, Ill, Headquarters, Philippine Department, Fort San Marcos, Manila

ORGANIZATION SECTION

OFFICIAL NOTES

FOURTH ANNUAL CONGRESS ON INDUSTRIAL HEALTH

Arrangements have been largely completed for the fourth annual Congress on Industrial Health sponsored by the American Medical Association, which will be held Monday and Tuesday, Jan. 12-13, 1942, at the Palmer House in Chicago. These meetings are open to physicians and others interested in industrial health. There is no registration fee. Topics and speakers are as follows:

OPENING SESSION, MONDAY, 9:45 A. M.

Report of the Council on Industrial Health

STANLEY J. SEEGER, M.D., Chairman, Texarkana, Texas.

Procurement and Assignment of Physicians in Industry

(Speaker to be announced)

Lecture on Industrial Medicine.

Tuberculosis in Industry—A Résumé.

LEROY U. GARDNER, M.D., Saranac Lake, N. Y.

Director, the Saranac Laboratory for the Study of Tuberculosis

The Physiology of Work

A. C. IYV, M.D., Chicago

Professor of Physiology, Northwestern University School of Medicine.

Medical Aspects of Vocational and Industrial Training

W. A. SAWYER, M.D., Rochester, N. Y.

Chairman, Committee on Industrial Health, Section on Preventive and

Industrial Medicine and Public Health, American Medical Association

Red Lacquer Room

MONDAY AFTERNOON, 2:30

A Dental Program for Industry

R. M. WALLS, D.D.S., Bethlehem, Pa.

Chairman, Committee on Economics, American Dental Association.

Industrial Dermatoses.

A Report by the Committee on Industrial Dermatology, Section on

Dermatology and Syphilology, American Medical Association

C. GUY LANE, M.D., Chairman, Boston

CHARLES C. DENNIE, M.D., Kansas City, Mo.

JOHN G. DOWNING, M.D., Boston.

HARRY FOERSTER, M.D., Milwaukee

EDWARD A. OLIVER, M.D., Chicago

MARION SULZBERGER, M.D., New York

The Panel System in Workmen's Compensation Administration.

DAVID J. KALISKI, M.D., New York

Director, Committee on Workmen's Compensation, Medical Society of

the State of New York.

Mass X-Ray Surveys—Evaluation of Technique and Equipment

MAJOR ALFRED A. DE LORIMIER, M.C., Washington, D. C.

Director, Department of Roentgenology, Army Medical School

Red Lacquer Room

MONDAY AFTERNOON, 2:30

SYMPOSIUM ON UNDERGRADUATE INDUSTRIAL MEDICAL EDUCATION

Present Problems in Curriculum Adjustment

WILLIAM D. CUTTER, M.D., Chicago

Secretary, Council on Medical Education and Hospitals, American

Medical Association

Industrial Health—A Separate Discipline

T. LYLE HAZLETT, M.D., East Pittsburgh, Pa.

Professor of Industrial Hygiene, University of Pittsburgh School of

Medicine.

Coordination of Industrial Hygiene with Clinical Teaching

DOUGLAS E. CUMMINGS, Denver

Director, Division of Industrial Hygiene, University of Colorado School

of Medicine and Hospitals

The Industrial Clinical Clerkship

FRED J. WAMPLER, M.D., Richmond

Professor of Preventive Medicine, Medical College of Virginia

Industrial Experience in the Internship

WILL F. LYON, M.D., Chicago

Assistant Professor of Surgery, University of Illinois College of Medi-

cine.

The Occupational Disease Clinic

MILTON H. KRONENBERG, M.D., Chicago

Assistant Professor of Bacteriology and Public Health, University of

Illinois College of Medicine.

Room 17

MONDAY EVENING, 6:30

An informal dinner and round table discussion, intended primarily for state and county medical society committees on industrial health, will be held. The program will include:

Use of Visiting Nurses in Industry.

MISS JOANNA JOHNSON, R.N., Milwaukee

Chairman, Industrial Nursing Section, National Organization for Public Health Nursing

Progress in Official Agencies.

J. J. BLOOMFIELD, Bethesda, Md.

Chief, States' Relations Section, U. S. Public Health Service, National

Institute of Health.

Postgraduate Education in Industrial Health

WALTER L. BIERRING, M.D., Des Moines, Iowa.

Commissioner, State of Iowa Department of Health.

Crystal Room

TUESDAY MORNING, 9:30

Conservation of Manpower in Connecticut.

CLIFFORD KUH, M.D., New Haven, Conn.

Chairman, Committee on Industrial Health, Connecticut State Medical Society.

Health Education for Industrial Workers.

LEVERETT D. BRISTOL, M.D., New York.

Chairman, Committee on Education and Publications, Council on Industrial Health, American Medical Association.

Lecture on Traumatic Surgery

(Speaker to be announced)

Industrial Ophthalmology.

A Report by the Committee on Industrial Ophthalmology, Section on Ophthalmology, American Medical Association.

ALBERT C. SNELL, M.D., Chairman, Rochester, N. Y.

ARTHUR CULLER, M.D., Dayton, Ohio

HEDWIG S. KUHN, M.D., Hammond, Ind

Placement of the Worker in Industry

JOSEPH TIFFIN, Ph.D., Lafayette, Ind

Professor of Industrial Psychology, Purdue University.

Red Lacquer Room

TUESDAY AFTERNOON, 2:30

Conservation of Hearing in Industry.

C. C. BUNCH, Ph.D., Evanston, Ill.

Department of Speech Reeduction, School of Speech of Northwestern University.

Recent Trends in Physical Examinations Under Civil Service.

VERNE K. HARVEY, M.D., Washington, D. C.

Medical Director, U. S. Civil Service Commission.

Vitamin Administration in Industry.

A Report Prepared by Representatives of the Council on Foods and Nutrition and the Council on Industrial Health

J. S. McLESTER, M.D., Birmingham, Ala.

GEORGE R. COWGILL, Ph.D., New Haven, Conn

R. M. WILDER, M.D., Rochester, Minn.

LEVERETT D. BRISTOL, M.D., New York

LEROY U. GARDNER, M.D., Saranac Lake, N. Y.

CLARENCE D. SELBY, M.D., Detroit.

Medical Service Plans for Small Industry

MYER S. BLOOM, M.D., Binghamton, N. Y.

Red Lacquer Room

WEDNESDAY, JANUARY 14

Field trips have been arranged for a limited number of physicians interested in details of industrial medical department administration. Further details will be provided to registrants during the Congress.

Also on Wednesday, January 14, a clinical program will be held in conjunction with the University of Illinois College of Medicine, illustrating practical problems in industrial medicine, industrial hygiene and traumatic surgery.

CLINICAL PROGRAM

University of Illinois College of Medicine,
1853 West Polk Street, Room 423,
Chicago

WEDNESDAY MORNING, 9:30

Pulmonary Capacity Tests in Health and Disease.

Demonstration:

GEORGE E. WAKERLIN, M.D.

Professor of Physiology.

Difficulties and Fallacies of Interpretation of Chest X-Ray Films

Demonstration:

ADOLPH HARTUNG, M.D.

Professor of Radiology.

Practical Points on Patch Testing in Occupational Dermatitis

Demonstration:

LEONARD F. WEBER, M.D.

Associate Professor of Dermatology.

Urinary, Blood and Other Tests of Value in Cases of Industrial Toxicology

Demonstration:

WILLIAM D. McNALLY, M.D.

Coroner's Chemist, Cook County, Chicago

WEDNESDAY AFTERNOON, 2:00

Evaluating the Traumatic Abdomen.

CHARLES A. PLESTOW, M.D.

Associate Professor of Surgery.

Dental and Oral Manifestations of Occupational Origin.

ISAAC SCROUR, D.D.S., Ph.D.
Professor of Dental Histology,
and
BERNARD SARNAT, D.D.S., M.D.
College of Dentistry.

The Industrial Hernia—Is It a Cause for Rejection?

WILL F. LYON, M.D.
Associate Professor of Surgery.

The Occupational Anemias.

CARROLL BIRCH, M.D.
Assistant Professor of Medicine.

ADDRESSES BY THE PRESIDENT AND THE PRESIDENT-ELECT

Dr. Frank H. Lahey, President of the American Medical Association, has been scheduled to deliver the following addresses during December:

December 2.—Rochester Academy of Medicine, Rochester, N. Y.

December 4.—Harrisburg Academy of Medicine, Harrisburg, Pa.

Dr. Fred W. Rankin, President-Elect of the American Medical Association, has been scheduled to deliver the following addresses:

December 9.—Southern Surgical Association, Pinehurst, N. C.

December 15.—Fulton County Medical Society, Atlanta, Ga.

EXHIBITS FROM HEADQUARTERS

December 1-5.—Wells High School, Chicago (Health Week):

"Periodic Health Examination."
"Prevention of Accidents."

December 1-5.—Carl Schurz High School, Chicago (Health Week):

"Health Material."

December 3.—Woman's Hospital, Detroit (Annual Clinical Hospital Day):

"The Use and Abuse of Barbiturates."

December 4.—Detroit Institute of Technology, Detroit (Open House, College of Pharmacy and Department of Chemistry):

"The Use and Abuse of Barbiturates."

December 4.—Women's Auxiliary, Marion County Medical Society, Fairmont, W. Va. (Health Institute):

"Your Health."

December 11-14.—Health Exposition, Kansas City, Mo.:

"The Human Factory."
"Respiratory System in Health and Disease."
"Heart Disease."
"Syphilis."
"Cancer."
"Prevention of Burns."
"Dangers of Self Diagnosis and Self Medication."
"Mechanical Nostrums."
"The Public Health."

WOMAN'S AUXILIARY

New York

At a business meeting of the Fulton County auxiliary at the home of Mrs. J. Edward Grant of Northville, the card party held at the Adirondack Inn, Sacandaga, in July by the auxiliary for Bundles for Britain was reported to have netted \$114, which will be divided equally between the Gloversville and Johnstown branches of the organization. The auxiliary made it possible for one underprivileged child to spend one week at the Fulton County Children's Camp during the summer.

At the first fall meeting of the Herkimer County auxiliary held in Herkimer, the guest speaker was Mrs. Marcus DeWolfe, who spoke on India. Mrs. DeWolfe lived there several years. The members discussed the advisability of meeting every month. The by-laws were revised and it will meet every month, the alternate month to serve as a sewing bee for the British War Relief. The summer camp at Pine Crest Sanatorium is its pet activity. The auxiliary held a card party and raised \$70, with which a slide was purchased for the playground.

Mrs. George B. Adams, president of the state auxiliary, addressed the Onondaga County auxiliary on May 29, when Mrs. George Sincerbeaux, retiring president, presented the gavel to Mrs. Carlton Bullard; other officers for the year include: first vice president Mrs. J. D. Sands, second vice president Mrs. Jason L. Wiley, treasurer Mrs. Herbert Jones, secretary Mrs. A. B. Chidester. It was decided to send two girls to the Girl Scout Camp for two weeks.

Attended by more than two hundred people, a ball was held at the Elks Club in Hudson by the women's auxiliary of Columbia County for the benefit of Bundles for Britain. Mrs. Henry C. Galster, president of the Hudson branch, was the chairman. Guests were present from New York, New Rochelle, Amsterdam, Albany and most of the towns of the county. The amount realized was over \$200.

South Dakota

At a meeting of the board of the Woman's Auxiliary to the South Dakota State Medical Association in Sioux Falls, November 18, the national president of the Woman's Auxiliary to the American Medical Association, Mrs. R. E. Mosiman of Seattle, spoke on different phases of the auxiliary work; other guests of honor were Mrs. F. C. Nilsson, president of the South Dakota Auxiliary, Sioux Falls, and Mrs. Zelda Krueger, Red Cross executive secretary. The Seventh District Medical Auxiliary were hosts at a luncheon which was attended by thirty-five members from throughout the state.

Wisconsin

The Woman's Auxiliary to the Dane County Medical Society presented Dr. Paul C. Barton in a talk on "Beauty Aids and Adds" in Madison, May 12.

At Fond du Lac on May 22, the Woman's Auxiliary to the Fond du Lac County Medical Society voted to send eight girl scouts to camp in the summer. Reports of recent card parties showed that \$73.50 had been cleared for philanthropic projects. Mrs. W. C. Finn of Fond du Lac is the new president, chosen to succeed Mrs. A. M. Hutter.

Gardens in May occupied the attention of the Woman's Auxiliary to the Milwaukee County Medical Society.

Mr. Robert Boerner of the Milwaukee Park Commission addressed the May 9 meeting. Colored slides of the flowers in Milwaukee parks were shown.

Activities in April and May included a luncheon at Hart House, near Milwaukee, at which the president, Mrs. C. D. Partridge, entertained the officers and board of directors, and a luncheon at the Wisconsin Club, Milwaukee, given by the officers, directors and past presidents in honor of Mrs. Partridge.

At their annual open meeting in Appleton, May 5, twenty-two members of the Woman's Auxiliary to the Outagamie County Medical Society were hostesses to two hundred and fifty guests. The speaker, Dr. Amy Louise Hunter of Madison, chief of the bureau of maternal and child health for the state of Wisconsin, discussed infantile paralysis, premature babies, education for motherhood and prevention of tuberculosis.

The Rock County auxiliary met in Beloit, May 27, to hear Mrs. Wayne Munn of Janesville give a reading of "The American Way."

The Woman's Auxiliary to the Waukesha County Medical Society entertained fifty people at a presidents' tea at the home of Mrs. A. G. Nixon in Hartland, May 22. Presidents and other representatives of lay organizations were invited to hear Mr. George Larson, assistant secretary of the Wisconsin State Medical Society, speak on experiments in voluntary sickness insurance. The audience asked many questions of the speaker. The auxiliary voted \$10 to the Dousman Home and Farm School for Boys toward a fund to provide adequate isolation facilities for scarlet fever cases.

In May, Mrs. Gerald H. Friedman of Milwaukee, state Hygeia chairman, reported that Wisconsin had exceeded the 1940 quota; to date, subscriptions number 880, compared with last year's 875.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Physicians' Art and Garden Societies.—The Los Angeles Physicians Art Society opened the fall season with a dinner at the Los Angeles County Medical Association on November 28. Mr. Roger Noble Burnham, Los Angeles, modeled a portrait in relief of a member of the audience, and Mrs. Burnham discussed the history of sculpture. The Los Angeles County Medical Garden Club recently held its fall flower show. Officers of the garden club include Drs. Robert B. Hope, president; Hyman Miller and Albert G. Bower, vice presidents, and Samuel Ayres Jr., secretary.

New Comprehensive Study of the Common Cold.—The University of California Medical School, San Francisco, began a comprehensive two year study of the common cold and other respiratory diseases in November. Ten members of the staff of the university will carry on the research under the direction of Dr. William J. Kerr, professor of medicine. One phase will be a study of the physical influences caused by changes in the weather and overcooling. A special room has been built large enough for six persons, in which the temperature and humidity of the air can be changed to any climatic condition quickly and at will. An attempt will be made to correlate all the facts concerning conditions which make a person susceptible to a cold.

ILLINOIS

Plan to Release "Socially Safe" Mental Patients.—Dr. Alfred P. Bay, assistant managing officer of the Alton State Hospital, Alton, has been appointed assistant state alienist to direct the program under which state officials propose to release several thousand "socially safe" patients from state mental hospitals, newspapers reported recently. Dr. Bay will supervise an outpatient clinic plan under which patients released will report regularly to hospital physicians for examination. He will be responsible for the release of patients at the Alton, Anna, Peoria, Jacksonville and East Moline hospitals.

Society News.—Dr. George L. Drennan, Jacksonville, discussed "Deafness in Childhood" before the Madison County Medical Society in Collinsville, October 3.—Dr. George C. Turner, Chicago, discussed "Early Diagnosis of Pulmonary Tuberculosis" before the Madison County Medical Society in Edwardsville, November 7.—The Peoria Medical Society and the local dental society were addressed at a joint dinner meeting in Peoria, November 18, by Dr. Joseph E. Schaefer, Chicago, on "Repair of Facial Injuries." The medical society was addressed, November 4, by Dr. Franklin G. Ebaugh, Denver, on "New Factors Regarding Mental Disorders."

Chicago

The Ludvig Hektoen Lecture.—The eighteenth Ludvig Hektoen Lecture of the Frank Billings Foundation, Institute of Medicine of Chicago, will be delivered on January 23 at the Palmer House by Dr. Stanhope Bayne-Jones, professor of bacteriology, Yale University School of Medicine, New Haven, on the subject "Tetanus."

INDIANA

Crum Guilty of Gross Immorality in Use of Etherator.—The Supreme Court of Indiana on November 3 upheld the action of the board of medical registration and education in revoking three licenses held by Heil E. Crum, one authorizing him to practice naturopathy, another to practice chiropractic and a third to practice electrotherapy, on the ground that the licensee was guilty of "immoral conduct." The evidence disclosed that, after attending high school, Crum entered the College of Drugless Physicians in Indianapolis, from which he was graduated at the end of one year with the degrees of doctor of naturopathy, doctor of electrotherapeutics, doctor of chiropractic and doctor of herbal materia medica. "The evidence supports the inference," said the Supreme Court, "that this institution was nothing more than a 'diploma mill.'" Crum received his three licenses, without examination, by virtue of a clause in the 1927 medical practice act of Indiana, commonly referred to as a "grandfather" clause, under which licenses

were issued to persons already practicing any system or method of healing taught by the school or college of which the applicant was a graduate. The gist of the complaint against Crum was that he employed a mechanical contrivance called an "etherator" or "coetherator" which was totally devoid of any therapeutic value. As described by the Supreme Court, the etherator was a small wooden box with a number of holes in the front over which various colors of thin paper were pasted. On the inside was an ordinary light bulb with a cord for making contact with electricity. The bulb could be moved about so that the light would penetrate the various paper covered holes. The box contained a quantity of disconnected wire such as is commonly used for radio aeriels and a glass tube filled with ordinary hydrant water. There was a pedal and a dial on the outside of the box, neither of which had any connection with the interior. The method used in treating human ailments was to have the patient moisten a slip of paper with saliva and deposit it through a slot on the top of the box, although it was claimed that the same results could be obtained by similar use of the patient's photograph or a specimen of his handwriting. After this was done, Crum would rub the pedal with his thumb and talk to the machine, repeating the popular names of diseases and organs of the body. Many of the diseases which he claimed to be able to treat and relieve, and in some instances cure, were cancer, blindness, arthritis, nervous disorders, hemorrhoids, abscesses, kidney ailments, stomach disorders, leakage of the heart, skin ailments, ovarian trouble, varicose veins and tumors. Crum further claimed that he could lengthen or shorten a patient's legs, cause amputated fingers to grow back into place and fill cavities in teeth, not with a foreign substance but by restoring them to their original condition. He said that it was not necessary for patients to be present or visit his office but that he could broadcast treatments to them wherever they might be located. By use of the machine, he claimed, he could fertilize fields to a distance of 70 miles, could kill dandelions over any particular area, could treat golf greens and could give financial treatments by means of which money could be put into the hands of his patients. The mere mention of the extravagant claims made by Crum, the court thought, was sufficient to suggest their untruthfulness and brand them as designedly fraudulent. Crum contended that by virtue of the three licenses that had been issued to him the state had authorized him to engage in the activities that prompted the revocation proceeding. In answer to this contention the Supreme Court considered it unnecessary to undertake to define the practice of chiropractic, naturopathy or electrotherapy. To the court it was enough to say that it could not be judicially presumed that the legislature intended to authorize a course of conduct so reprehensible and revolting as to shock the sensibilities of reasonable men.

IOWA

Postgraduate Lectures.—The speakers' bureau of the Iowa State Medical Society sponsored the following postgraduate lectures during November:

- Dr. Kellogg Speed, Chicago, A Discussion of War Wounds, Davenport, November 4.
- Dr. Jerome R. Head, Chicago, Chest Injuries, Marshalltown, November 4.
- Dr. Willis M. Fowler, Iowa City, Diseases of the Blood, Newton, November 4.
- Dr. Paul C. Bucy, Chicago, Making a Neurologic Examination in General Practice, Ottumwa, November 4.
- Dr. Horace M. Korns, Iowa City, Diagnosis and Treatment of Pneumonia, Newton, November 11.
- Dr. John W. G. Caldwell, Des Moines, Recent Treatment of Pneumonia, Toledo, November 13.
- Dr. Harold F. Buchstein, Minneapolis, Making a Neurological Examination, Jefferson, November 13.
- Dr. Arthur U. Desjardins, Rochester, Minn., Therapeutic Value of X-Ray, Boone, November 13.
- Dr. Wilbur C. Thatcher, Fort Dodge, Management of Obstetric Difficulties, Spirit Lake, November 18.
- Dr. Walter A. W. Kirch, Des Moines, Common Diseases of the Ear, Nose and Throat, Ottumwa, November 18.
- Dr. Frank R. Peterson, Iowa City, Acute Surgical Conditions in the Abdomen in Childhood, Newton, November 18.
- Dr. Daniel J. Glomset, Des Moines, Treatment of Heart Failure, Red Oak, November 18.
- Dr. Frederic W. Schlutz, Chicago, Common Disease of Childhood, Carroll, November 20.
- Dr. Dean M. Lierle, Iowa City, Diagnosis and Treatment of Common Conditions of the Ear, Nose and Throat, Newton, November 25.

KANSAS

Dr. Westman Named Federal Consultant in Epidemiology.—Dr. Ragnar T. Westman resigned as health director of Kansas City November 1 to assume rank as surgeon of the U. S. Public Health Service and serve as federal consultant in epidemiology to extra cantonment and defense areas, it is reported. He is stationed in Bethesda, Md.

Society News.—The Sedgwick County Medical Society designated its November 18 meeting as "University of Kansas School of Medicine Night"; the speakers were Drs. Harry R. Wahl, dean of the school, on activities of the school; John A. Billingsley, Kansas City, "Aniseikonia"; Mahlon H. Delp, Kansas City, "Treatment of Arsenical Dermatitis with Vitamin C" and Frank C. Neff, Kansas City, Mo., "Adrenal Androgenic Tumors."

Cooperating Committees on Legal Medicine.—The Kansas Medical Society and the Kansas Bar Association have appointed committees on legal medicine to study jointly and prepare recommendations on matters of interest to both the legal and the medical profession. Members of the bar association committee are Mr. Claude I. Depew, Wichita, chairman; Mr. Roy C. Davis, Hutchinson; Mr. John H. Hunt, Topeka; Mr. Oscar P. May, Atchinson; Mr. Larue Royce, Salina, and Mr. Thomas M. Van Cleave, Kansas City. Members of the medical society's committee are Drs. Earl L. Mills, Wichita; Clyde D. Blake, Hays; Eugene J. Bribach, Atchinson; John J. Brownlee, Hutchinson; John L. Lattimore, Topeka, and Laurence S. Nelson, Salina.

MICHIGAN

Personal.—Dr. Charles H. P. G. Benning, Royal Oak, deputy commissioner of health of Oakland County for more than thirteen years, has been assigned to the department of health of Puerto Rico, San Juan, as venereal disease consultant by the U. S. Public Health Service.—Dr. Thomas P. Crane, Dearborn, has been placed in charge of the outpatient department at the Veterans' Administration Facility in Dearborn, succeeding Dr. Edward O. Sage, who was transferred to New Orleans.—Citizens of Baraga sponsored a dinner recently in honor of the seventy-fifth birthday of Dr. Romulus S. Buckland who has been practicing in Baraga for forty-one years. He was presented with a plaque bearing a replica of himself mounted on horseback.

Society News.—Dr. Lyman T. Rawles, Fort Wayne, Ind., is the new president of the Northern Tri-State Medical Association. Other officers of the association, which met in annual session in Detroit recently, include Drs. E. Benjamin Gillette, Toledo, vice president; Douglas Donald, Detroit, treasurer, and Floyd R. N. Carter, South Bend, secretary. The sixty-ninth annual meeting of the association will be held in Fort Wayne, April 7, 1942.—Dr. Ernest E. Irons, Chicago, addressed the medical section of the Wayne County Medical Society, Detroit, November 10, on "Aspiration Pneumonia." Dr. Michael L. Mason, Chicago, discussed "Significant Factors in the Development of Infections of the Hand" before the surgical section of the society, October 27.—Dr. Herman H. Riecker, Ann Arbor, addressed the Calhoun County Medical Society, Battle Creek, October 7, on "Classification and Management of Hypertension."

NEBRASKA

Hospitals Cooperate in Clinic.—The staffs of the Lincoln General and Bryan Memorial hospitals, Lincoln, sponsored a two day clinic, October 17-18, with sessions at both hospitals. Included among the guest speakers were Drs. Fred J. Hodges, professor of roentgenology and chairman of the department, Stanley M. Goldhammer, assistant professor of internal medicine, University of Michigan Medical School, Ann Arbor, Philip M. Northrop, D.D.S., assistant professor of oral surgery, University of Michigan School of Dentistry, Ann Arbor, and Dr. Robert Lee Hoffmann, Kansas City, Mo.

NEW JERSEY

Society News.—Dr. Thomas Fitz-Hugh Jr., Philadelphia, discussed "Management of Anemia in General Practice" before the Camden County Medical Society in Camden, November 4.—The Hudson County Medical Society was addressed in Jersey City, October 7, by Dr. James William Hinton, New York, on thyroid disease.

New State Director of Health and Physical Education.—Dr. Wilson G. Guthrie, Newark, has been appointed director of health and physical education of the state department of public instruction to succeed the late Dr. Allen G. Ireland, Trenton. Dr. Guthrie graduated at the University of Tennessee College of Medicine, Memphis, in 1918.

NEW YORK

Appointments to Industrial Council.—Dr. Benjamin M. Eis, Brooklyn, has been appointed a member of the state industrial council to fill a vacancy caused by the death of Dr. Henry Joachim, Brooklyn, and Dr. Van S. Laughlin, Westfield, has been named to fill a vacancy that occurred with the resignation of Dr. William D. Johnson, Batavia.

Annual Surgical Session at Buffalo.—The annual meeting and clinical day of the Western New York Surgical Society was held at the Edward J. Meyer Memorial Hospital, Buffalo, November 27, with Drs. John D. Stewart, Buffalo, and Edward D. Churchill, John Homans professor of surgery, Harvard Medical School, Boston, as guest speakers. Others on the program included:

Dr. Henry N. Kenwell, Buffalo, Liver Abscess with the Report of the Surgical Treatment of a Recent Case.
Dr. Donald P. Ross, Niagara Falls, Gastric Resection for Peptic Ulcer.
Dr. George W. Cottis, Jamestown, Perpetuation of the Fallacy of Peritoneal Drainage.
Dr. Joseph D'Errico Jr., North Tonawanda, Surgery of Renal Anomalies.
Dr. James P. Cole, Buffalo, Importance of the Lumbosacral Joint in Low Back Pain.
Dr. Leon J. Leahy, Buffalo, Surgical Collapse Therapy in Pulmonary Tuberculosis.

New York City

Professor Appointed.—Dr. William Carson Von Glahn, formerly associate professor of pathology at Columbia University College of Physicians and Surgeons, has been appointed professor of pathology at New York University College of Medicine and director of the department of pathology and laboratories at Bellevue Hospital. An agreement worked out between the city and New York University gives the university the privilege of nominating all members of the department of pathology of Bellevue Hospital and of the laboratory staff, it is reported.

Conference on Tuberculosis.—The Tuberculosis Sanatorium Conference of Metropolitan New York will sponsor a meeting on chronic pulmonary diseases at Cornell University Medical College December 10. Dr. Max Pinner, chief of the division of pulmonary diseases, Montefiore Hospital for Chronic Diseases, will read a paper on "Experimental Studies on Bronchiectasis and Atelectasis," which was prepared by Dr. Pinner and Dr. Joseph Tannenber, Batavia. Dr. John E. Leach, clinical assistant in medicine, Memorial Hospital for the Treatment of Cancer and Allied Diseases, will present a paper on "Radiation Pleuropulmonitis."

Survey of Abortion Racket.—A comprehensive survey of a citywide abortion racket was handed up in presentment form in Brooklyn Supreme Court, October 15, according to the New York Times. The grand jurors recommended a campaign of public education against the dangers of abortions and a penal code provision making it a misdemeanor to offer to perform a criminal abortion or to refer a patient to another physician for an illegal operation. The report also recommended increased vigilance by local police in detecting and reporting establishments for abortions and an interchange of information between the department of education and the police department. The replacement of the present medical grievance committee of ten members serving part time without compensation by a full time committee of physicians with compensation was also urged.

Lectures on Occupational Diseases.—The Medical Society of the County of Kings and Academy of Medicine of Brooklyn opened a course of lectures on industrial health and occupational diseases in Brooklyn, November 24. "Origins and Growth in Industrial Health" was discussed in the first series by Dr. Alfred E. Shipley, Brooklyn, Eugene B. Patton, director, division of statistics, New York State Department of Labor, and a speaker whose name was not announced. Other lectures include:

Drs. Samuel J. Kopetzky, New York, Albert F. R. Andresen, Brooklyn, Alec N. Thomson, Brooklyn, and Charles F. McCarty, Brooklyn, Role of the County Medical Society in an Industrial Health Program and the National Defense Program, December 1.
Mr. Henry D. Sayer, Drs. David J. Kaliski, New York, and Fred L. Moore, Brooklyn, Compensation Law: Progress and Present Interpretation, December 8.
Drs. John Hamilton Crawford, Brooklyn, and George G. Ornstein, New York, Relationship Between Injury and Disease, December 15.
Drs. Louis Berger, Joseph B. L'Episcopo, Samuel Potter Bartley and William E. Howes, Brooklyn, Traumatic and Orthopedic Surgery, January 5.
Drs. John E. Jennings, Joseph E. Golding and Edwin K. Morgan, Brooklyn, Traumatic Surgery, January 12.

Various aspects of occupational diseases will be discussed by Drs. Leonard Greenburg and May R. Mayers, New York, January 19; Abraham Walzer, Brooklyn, Max Harten, Brooklyn, and Eugene R. Marzullo, Brooklyn, January 26; Irving Gray, Brooklyn, and George N. Edson, Flushing, N. Y., Feb-

ruary 2; Charles T. Graham-Rogers, Brooklyn, John J. Wittmer, Brooklyn, Niel E. Eckelberry, New York, and a speaker to be announced, February 9, and Harry Heimann, Thomas A. Gonzales, New York, and Edmund A. Whalen, LL.B., counsel, Medical Society of the County of Kings, February 16.

OHIO

Youth Health Program Resumed on Smaller Scale.—The NYA health program in Ohio will be resumed on a smaller scale through adjustments made by local officials, the state medical journal reports. A reduction in the allocation of funds to the project was responsible for a recent curtailment of the program. Under the new set up a reduction will be made in the number of areas of the NYA in Ohio from eight to six. A health supervisor will be provided for each of the six districts with Dr. Carl A. Wilzbach, health commissioner of Cincinnati, continuing as state health consultant. Use will be made in a limited way of the physicians who had been engaged in the various counties on a per diem basis to make physical examinations of NYA youths. For the present those who will be given examinations fall into three classifications: those scheduled to go to camps and resident centers, those with obvious physical defects and those receiving shop training for subsequent employment in national defense industries.

Personal.—Dr. William E. Lower, for many years chief of staff at the Lutheran Hospital, Cleveland, was honored at a luncheon on October 16 by friends and associates of the hospital. The luncheon was planned by Dr. Norman C. Yarian, the present chief of staff, who succeeded Dr. Paul H. Krebs, a former chief of staff, he having succeeded Dr. Lower and Dr. Emanuel Klaus, who is on the staff.—Dr. Bruno Gebhard, director of the Cleveland Museum of Health and Hygiene, has been invited by Dr. Angel de la Garza Brito, dean of the School of Public Health and Hygiene, Mexico, to visit Mexico City to confer with local authorities on the establishment of a health museum.—Dr. James F. Wilson, Washington C. H., secretary of the Fayette County Medical Society, recently completed his fifteenth year as health commissioner of the county.—Dr. James W. Fitch has retired as physician for the Home for Aged Women, Portsmouth, a service which he had donated for forty years.—Charles L. Spoler has been named executive secretary of the Scioto County Tuberculosis and Health Association. He had been formerly connected with the WPA administrative staff at Zanesville.

OREGON

Diseases of the Chest.—The second annual postgraduate session of diseases of the chest will be held at the University of Oregon Medical School, Portland, December 11-13, under the auspices of the Pacific Northwest Section of the American College of Chest Physicians and the medical school. The program has been designed as a review of present day therapy in diseases of the chest. The guest speaker will be Dr. Leo Eloesser, clinical professor of surgery, Stanford University School of Medicine, San Francisco. His subjects will be "Causes of Pulmonary Cavitation" and "Treatment of Pulmonary Cavities by Various Methods of Closed Drainage."

PENNSYLVANIA

Society News.—The Reading Eye, Ear, Nose and Throat Society was recently organized with Dr. James E. Landis as president and Dr. Paul C. Craig, secretary. Official recognition and approval was given to the new society by the American Academy of Ophthalmology and Otolaryngology at its meeting in Chicago in October. Membership will be extended by invitation to eligible physicians who hold active membership in the Berks County Medical Society and the Medical Society of the State of Pennsylvania.

Philadelphia

Annual de Schweinitz Lecture.—Dr. Harry Friedenwald, professor emeritus of ophthalmology, University of Maryland School of Medicine, Baltimore, delivered the fourth annual de Schweinitz Lecture before the Section on Ophthalmology of the College of Physicians of Philadelphia, November 19, on "The Paths of Progress of Ophthalmology."

Meeting on Medical History.—The section on medical history of the College of Physicians of Philadelphia presented the following program, November 10: Drs. Pascal F. Lucchesi, "History of Poliomyelitis"; Eugene P. Campbell, "Influenza—Past and Present," and Milton I. Rose, "Contributions of Pediatrics to Modern Public Health Philosophy."

WEST VIRGINIA

Society News.—Dr. Richard B. Cattell, Boston, addressed the Ohio County Medical Society, Wheeling, September 26, on "Diagnosis and Management of Biliary Tract Disease." Dr. Joseph H. Barach, Pittsburgh, addressed the society, October 10, on "Present Day Treatment of Diabetes and Complications."—Dr. Martin L. Bonar, Charleston, addressed the Fayette County Medical Society, Montgomery, recently on diseases of the skin.—Dr. Dean B. Cole, Richmond, Va., addressed the Cabell County Medical Society, Huntington, September 11, on "Pneumothorax Treatment of Tuberculosis." Dr. Warren T. Vaughan, Richmond, Va., addressed the society recently on "Problems in Allergy of Interest to the General Practitioner."—Dr. George P. Sturgis, Boston, addressed the Kanawha Medical Society, Charleston, recently on "Heart Disease in Pregnancy."

PUERTO RICO

Lectures on Tropical Medicine.—The School of Tropical Medicine of the University of Puerto Rico, San Juan, under the auspices of Columbia University, opened a series of lectures on tropical medicine, November 5, to continue until January 21. The lecturers are Dr. Ramón M. Suárez, head of the department of clinical medicine of the school; Dr. Rafael Rodríguez Molina, assistant professor of clinical medicine, and Dr. Federico Hernández Morales, medical supervisor of the University Hospital, San Juan. The subjects covered are lymphogranuloma venereum; sprue, pellagra, ariboflavinosis and other deficiency diseases; Weil's disease; yaws, rat-bite fever; typhoid; paratyphoid A and B; amebic dysentery; tropical lymphangitis; clinical aspects of intestinal parasites; malarial fevers and blackwater fever; Schistosomiasis mansoni. Science reports that the following have been appointed visiting professors at the School of Tropical Medicine:

Col. Alexander T. Cooper, M. C., U. S. Army, retired, San Juan, military medicine.

Dr. Joseph O. Dean, San Juan, U. S. Public Health Service, public health practice.

David B. Dill, Ph.D., professor of industrial physiology and consulting physiologist to the hygiene department, Harvard University, Cambridge, physiology.

Dr. James A. Doull, professor of hygiene and public health, Western Reserve University School of Medicine, Cleveland, epidemiology.

Dr. Thomas H. D. Griffiths, San Juan, U. S. Public Health Service, public health.

Dr. William B. Porter, professor of medicine, Medical College of Virginia, Richmond, medicine.

William H. Tallaferro, Ph.D., dean, Division of the Biological Sciences, University of Chicago, protozoology.

GENERAL

New Radio Health Campaign.—The Federal Security Agency, the U. S. Public Health Service and the U. S. Department of Agriculture are cooperating with the Women's National Emergency Committee and the National Broadcasting Company in presenting the new fall and winter series of "Listen America," the coast to coast radio campaign for better national health, which opened on November 23. Included on the premier program was Dr. William Henry Sebrell Jr., of the Federal Security Agency, Washington, D. C.

Dr. Williams Receives Vitamin Award.—Robert R. Williams, D.Sc., chemical director of the Bell Telephone Laboratories, New York, since 1925, was presented with the annual award of the Associated Grocery Manufacturers of America, Inc., during the session in New York, November 7, in recognition of his work on the vitamins. Dr. Williams is credited with isolating Vitamin B₁. In 1938 the Chicago Section of the American Chemical Society presented the Willard Gibbs medal to Dr. Williams for "outstanding work in connection with the study and isolation of the beriberi vitamin."

Examinations for Orthoptic Technicians.—The American Orthoptic Council will conduct two examinations for orthoptic technicians in 1942. The first examination will be held in New York preceding the annual session of the American Medical Association in Atlantic City in June, and the second will be held in San Francisco preceding the meeting of the American Academy of Ophthalmology and Otolaryngology in October. One written examination will be conducted throughout the country in May, one month prior to the first examination. Applications to take this examination must be received before April 1. Only those passing the written examination will be eligible to take either of the practical and oral examinations.

Bailey K. Ashford Award.—The American Society of Tropical Medicine at its annual meeting in St. Louis, November 11, presented the Bailey K. Ashford Award in Tropical Medicine to Lloyd E. Rozeboom, Sc.D., associate in medical entomology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, for proving malaria transmission in

a variety of mosquito suspected but never demonstrated to be a carrier of the disease. The award of \$1,000, a bronze medal and travel expenses has been made available by Eli Lilly & Co., Indianapolis. A native of Orange City, Iowa, Dr. Rozeboom is 33 years of age. He served as assistant medical entomologist at the school of hygiene and public health from 1931 until 1934 and in this year received his D.Sc. degree at Johns Hopkins University. He has been medical entomologist at the Gorgas Memorial Laboratory, Ancon, C. Z., since 1934.

Applications for Cancer Fellowships.—The Finney-Howell Research Foundation, Inc., announces that all applications for fellowships for next year must be filed in the office of the foundation, 1211 Cathedral Street, Baltimore, by Jan. 1, 1942. Applications received after that date cannot be considered for 1942 awards, which will be made the first of March 1942. Fellowships carrying an annual stipend of \$2,000 are awarded for the period of one year, with the possibility of renewal up to three years; when deemed wise by the board of directors of the foundation, special grants of limited sums may be made to support the work carried on under a fellowship. The foundation was provided for in the will of the late Dr. George Walker of Baltimore to support "research work into the cause or causes and the treatment of cancer." The will directed that the surplus income from the assets of the foundation together with the principal sum should be expended within ten years to support a number of fellowships in cancer research.

Special Society Elections.—Dr. Noel Paul Hudson, Columbus, Ohio, was chosen president-elect of the American Society of Tropical Medicine at its meeting in St. Louis conjointly with the Southern Medical Association, November 10-13, and Ernest Carroll Faust, Ph.D., New Orleans, was inducted into the presidency. Other officers include Drs. Joseph S. D'Antoni, New Orleans, vice president, and E. Harold Hinman, Wilson Dam, Ala., secretary-treasurer. Karl F. Meyer, Ph.D., of the George Williams Hooper Foundation for Medical Research, San Francisco, delivered the sixth Charles Franklin Craig Lecture on Tropical Medicine on "The Known and the Unknown in Plague." At the annual luncheon of the society Dr. Thomas T. Mackie, New York, the outgoing president, delivered his address on "Observations on the Early History of Tropical Medicine."—Dr. C. Sidney Burwell, Boston, was named president of the American Clinical and Climatological Association at its annual meeting in Boston, October 27. Other officers chosen include Drs. C. Maurice Pincoffs, Baltimore, and Francis M. Rackemann, Boston, vice presidents, and James Bordley III, Baltimore, secretary. The next annual session will be held in Princeton, N. J., Oct. 12-14, 1942.

Pharmacopoeia Convention.—The board of trustees of the United States Pharmacopoeial Convention announces that the adjourned meeting of the U. S. P. convention will reconvene at the Statler Hotel, Cleveland, on April 7. This meeting is in accordance with instructions given by the 1940 convention "... to meet at the call of the Board of Trustees to receive the report of the Committee on Constitution and By-Laws ..." This committee consists of nine voting members of physicians, pharmacists and one representative of a governmental agency:

Dr. Allen H. Buncie, Atlanta, Ga., chairman.
Wortley F. Rudd, Ph.D., Richmond, Va.
Patrick H. Costello, Cooperstown, N. D.
Carson P. Frailey, Washington, D. C.
Dr. William A. Groat, Syracuse, N. Y.
Dr. Theodore G. Klumpp, Chicago.
Charles H. Rogers, D.Sc., Minneapolis.
Dr. Torald H. Sollmann, Cleveland.
Dr. Horatio C. Wood Jr., Philadelphia.

Ex officio members are Dr. Cary Eggleston, New York, Lewis E. Warren, M.Sc., Washington, D. C., president and secretary of the convention, respectively, and E. Fullerton Cook, Ph.D., Philadelphia, chairman of the revision committee.

Dr. DeKleine Retires as Head of Red Cross.—The retirement of Dr. William DeKleine, Washington, D. C., as director of medical and health service of the American Red Cross was recently announced. His successor is Dr. Albert S. McCown, Washington, D. C., who has been serving as assistant director since June. Dr. DeKleine's service with the American Red Cross began in 1927 during the Mississippi Valley flood relief work. Since 1928, when he joined the regular staff, he has served as medical director. Previously he had been with the Michigan State Department of Health as director of the tuberculosis division. In 1925 he directed the five year child health demonstration at Mansfield, Ohio, with funds furnished by the Red Cross. He later supervised similar demonstrations at Fargo, N. D., and Salem, Ore. He graduated at Northwestern University Medical School, Chicago, in 1906. Dr. McCown was born in Lexington, Va., in 1890 and graduated at Johns Hopkins University School of Medi-

cine, Baltimore, in 1918. Positions he has held during his career include director of child health division, Washington State Health Department, 1934-1935; director of the division of maternal and child health, U. S. Children's Bureau, Washington, D. C., 1935-1937; deputy commissioner of health of the Michigan State Department of Health, Lansing, 1939, and director of the research and training unit, bureau of child hygiene, New York City Department of Health, 1940-1941.

Annual Meeting of Foundation for Infantile Paralysis.—The second annual medical session of the National Foundation for Infantile Paralysis was held at the New York Academy of Medicine, New York, December 3-5, with President Basil O'Connor, LL.B., presiding. A meeting of all medical advisers of the foundation, which opened the session, was followed by a program covering the activities of the committees of the foundation. At the second day's session a new feature was the presentation of prepared summaries of progress reports by the chairmen of the committees on education, nutritional research, virus research, medical publications, after-effects and epidemics and public health, participated in by grantees of the foundation. The afternoon was devoted to reports showing various means by which the foundation is combating the disease both from epidemiologic as well as from nursing and general public health points of view. The speakers were:

Dr. Felix J. Underwood, Jackson, Miss., Assistance Rendered by the National Foundation to States During Epidemic Periods.

Dr. Edward A. Piszcsek, Chicago, Study of an Outbreak in West Suburban Cook County.

Jessie L. Stevenson, R.N., consultant in orthopedic nursing, National Organization for Public Health Nursing, New York, Nursing Responsibilities in Epidemics of Infantile Paralysis.

Miss Lilyan Starr, executive secretary, Georgia state chapter, Atlanta, Functions of a State Chapter of the National Foundation During Epidemic and Endemic Poliomyelitis.

The president's dinner was held in the evening with Mr. O'Connor as the speaker. Committee meetings occupied the third day's program.

LATIN AMERICA

Pediatric Scholarship.—Dr. Julio Meneghello Rivera, assistant in the department of pediatrics of the Hospital Manuel Arriarán, will study at the Johns Hopkins University School of Medicine, Baltimore, under a scholarship from the American Academy of Pediatrics. The scholarship was awarded through the Sociedad Chilena de Pediatría to the author of the paper considered best in a competitive group.

Brazilian Ophthalmologists Form Examining Board.—The Brazilian Board of Ophthalmology was recently established with Dr. Cesario de Andrade, Rio de Janeiro, as president and Dr. Moacyr E. Alvaro, São Paulo, as secretary. The board is made up of the professors and assistant professors of ophthalmology of all the Brazilian universities and the presidents of all Brazilian societies of ophthalmology.

Medical Education in Mexico.—The theme for the annual contest sponsored by the Academia Nacional de Medicina de Mexico is this year "Medical Education in Mexico." The contest was to close on November 30. Two channels were open for consideration: "Suggestions on Modifications Proper for the Country" and "Pharmacodynamics of Sulfanilamide and Its Derivatives." The winner of the contest will be given 100 Mexican pesos and a certificate of honor and, in addition, a number of reprints of the winning essay.

Society News.—Members of the Sociedad de Oftalmología de Litoral were guests of the Sociedad de Oftalmología de Córdoba at a recent meeting with the following speakers: Drs. Carlos Weskamp, professor of ophthalmology in the faculties of medicine of Rosario and the National University of Litoral, Argentina, on "Observations on Serous Chorioretinitis of the Macula"; Juan M. Vila Ortiz, assistant professor of ophthalmology and ophthalmologist of the department of labor of Rosario Province, Argentina, "Considerations of Medical-legal Expert Testimony," and Isaac Cotlier, substitute professor of ophthalmology of the Faculty of Medicine of the National University of Litoral, Argentina, "The Stenopaeic Macular Perforations in Examinations for Refraction."

CORRECTION

Stipulations.—In the Bureau of Investigation department of THE JOURNAL for November 15, page 1727, appeared an abstract stating that the Federal Trade Commission had announced a stipulation with one Abram R. Canter of Pittsburgh, who sold "certain corsets and girdles known by the trade name 'Camp' and other so-called 'reducing girdles'" (quoted from the stipulation). This dealer is no part of the S. H. Camp & Company, and the latter firm reports that it markets no garment under the name Camp "reducing girdle."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 18, 1941.

International Conference of Scientists

The opening of a conference of scientists in London called by the British Association for the Advancement of Science has been described in a previous letter. The principles adopted by the council were announced. Intellectual freedom is held to be an essential condition of human progress. The special responsibility of scientists in the struggle to maintain intellectual liberty is asserted. The war now devastating the world involves an age old conflict of ideas. Liberal minds of the last generation were convinced that the battle for freedom of thought was finally won; yet once again this conviction is being violently assailed.

A recorded speech from General Smuts, a past president of the association, was broadcast from Capetown. He said that science was the greatest torch which the spirit of man had kindled in the modern world and that nothing—not even in this dark hour—should be allowed to interrupt its kindly light. It was fitting that this conference should be held in Britain, the mother of modern democracy. Science and democracy stood or fell together. The whole ethical basis of our western way of life was challenged. The "new order" was a return to the old slavery with the Gestapo added. In particular the proud position of science was challenged and degraded until it became no better than propaganda for myths and beliefs long discarded.

MAN IN DANGER OF EXTINCTION

Mr. H. G. Wells, who presided over a section on Science and the World Mind, said that what he would call the world mind was not really a coordinated mind at all: it was a gabble of unheeded and inconsecutive shoutings. If some vast superhuman intelligence was to ask "What is Man thinking now?" the answer would be "He is in fever and is delirious. He has muttered all sorts of things in the past, but now he is waking up very painfully and he talks louder." Unless man adapted himself to changing circumstances he might become extinct. Could he do this with sufficient rapidity to become a progressive superhomo or would he become one of a series of degenerating subhuman species or so fail as to end altogether? The records of the past were against the idea of any survival whatever of the human strain. We intellectual workers have to decide whether we are to be slaves and do what we are told by our masters the gangsters and profiteers or take our rightful place as servant masters of the world. We have the makings of a great international for pulling our scatterbrained world into a sane mentality. To have peace on the earth henceforth there must be federal control of international transport and a fundamental declaration of human rights, ensuring for all a fair participation in the resources of our planet. We needed a common language and a world encyclopedia.

Prof. Julius Lowy, formerly of Prague University, said that the health services of the European countries would not be equal to the great demands which would be made on them after the war. He proposed that the natural resources of Europe, such as sunlight, sea and mountain air, climatic factors and medicinal springs, should be used more systematically. A body should be appointed to draw up a scheme for their international use and to consider financial schemes for putting this into practice.

Mr. Allen of the American Red Cross spoke of the help his organization had given to France since the German occupation. They found the hospitals completely denuded. The

Germans had taken all the equipment and supplies. The French were left to set up hospitals in churches and schools and for their operating rooms used instruments from hardware stores.

Germany Violates International Convention for Repatriation of Sick and Wounded Soldiers

The conditions governing repatriation of sick and wounded prisoners of war are clearly stated in article 68 of the International Convention, to which Germany is a signatory. It runs as follows: "Belligerents shall be required to send back to their own country without regard to rank or numbers, after rendering them in a fit condition for transport, prisoners of war who are seriously ill or seriously wounded." Germany has now added a violation of this undertaking to the violations of treaties perpetrated by her in pursuit of her objects. Proposals for repatriation have been under discussion through the protecting power for many months, but the two governments were unable to reach agreement on the question of route and mode of transport. But on September 1 the British government received a proposal from the German government, through the Swiss legation, suggesting that sick and wounded should be repatriated in a British hospital ship through channel ports. This suggestion had been made by the British government several months before and rejected by Germany. The British government now accepted the proposal. On September 9 it received through the American embassy a message from the German government stating that there were twelve hundred British prisoners of war approved for repatriation by the mixed medical commission in Germany. The German government expressed the hope that sick and over age civil internees might also be repatriated. It also said that as we were sending only one hundred and fifty German prisoners of war our government might consider its gain in the exchange and send some civilians; also that we might fill available space in the hospital ships with German civilian women and children and men not of military age. Our government agreed to this and offered to send as a token of its intention a first batch of sixty German civilians. Then on October 2 the German government replied that "in view of the unsatisfactory attitude" of our government it would agree only to a limited exchange on a numerical basis. It was evident that it was attempting at the last moment to overthrow the previously agreed basis for repatriation. In view of this flagrant breach of faith our government reluctantly canceled the sailing of the ships. If it accepted the German change, the bulk of the British wounded would have lost their chance of repatriation. This breach of faith violates the International Convention, which states that repatriation shall take place "without regard to rank or numbers."

American Gift of Surgical Instruments

A gift of surgical instruments from the Columbia Medical Center of New York to the Charing Cross Hospital, London, was handed over by Sir Alfred Webb-Johnson, president of the Royal College of Surgeons. Mr. Lennox Ross Broster, a surgeon of the hospital, visited the United States this year to deliver two of the American society's official lectures. In making the presentation the president said that Mr. Broster's mission had been an enormous success. In addition to upholding the honor of British surgery he had made our American friends realize our gratitude and need. As a result, the Charing Cross Hospital had received this splendid gift of instruments, which came at a most opportune time, when the hospital was opening a new operating room. Mr. Philip Inman, chairman of the hospital, expressed the gratitude to the governors of the Columbia Medical Center.

SWITZERLAND

(From Our Regular Correspondent)

Oct. 15, 1941.

Investigation of Causes of Goiter

The question of the causes of goiter was discussed by Prof. Dr. J. U. Duerst before the Swiss goiter commission on the basis of a recent book, which summarizes investigations that cover a period of thirty-two years. These studies were begun at the suggestion of the late surgeon Professor de Quervain, who had studied the thyroid throughout his life. The initial investigations concerned the first appearance of the thyroid gland in fishes. The anatomists had disputed for decades whether the thyroid belongs to the respiratory or the digestive system. Duerst demonstrated that the thyroid, like the lung and the thymus, is an organ of the branchial canal, which is formed from remnants of the branchial clefts and thus must belong to the respiratory system. He was able to demonstrate in forty-five species of fish and in more than two hundred individuals that the thyroid and the thymus are closely connected with the gas exchange in the water. Great differences exist between the fish that live in the well oxygenated upper layers of water and the fish that inhabit the deeper strata in which the water has a lower oxygen and a higher carbon dioxide content. In surface fish the thyroid and thymus disappear after puberty, whereas in deep water fish the thyroid persists often into an advanced age and the thymus often shows proliferation at the time of puberty and is transformed into a reservoir for lymphocytes. That the thyroid as well as the thymus belongs to the gas exchange system has been corroborated in reptiles and in birds by the fact that the thyroid is attached tightly to the carotid and grows bilaterally, to the right and left of the heart, into the thorax; it is not connected, as was asserted previously, with the larynx of birds. Up to this developmental level in the animal kingdom the thyroids that do occur represent colloid glands; in old fishes and in birds parenchymatous forms seem to exist occasionally, but only in diseased animals. The colloid form is the normal one in these animals. Both forms, that is, colloidal and parenchymatous glands, appear for the first time in mammals. In these animals diet exerts a great influence; it could be demonstrated that a diet with "a high acid content" effects an increase of the parenchymatous glands; the same takes place as a result of internal disturbances of the acid-base equilibrium of the tissues. In the presence of alkalosis, however, the colloid thyroid was always preserved, and under certain conditions it developed into a colloid goiter.

Investigations on marmots and hedgehogs led to the conclusion that in all types of animals the thymus is concerned chiefly with the neutralization of acids; the thyroid, on the other hand, with the regulation of the oxygen supply. The relation between oxygenation of the respiratory air and the size of the thyroid was demonstrated by Duerst in correlation computation on cattle.

The etiologic factors in goiter in man were investigated on the basis of these investigations. Studies on gas metabolism disclosed two fundamental errors in the prevailing conception. Detailed analyses disclosed that an increase of 100 meters in altitude reduced the weight of the oxygen by about 1 per cent and that expansion due to heat reduces the weight by 0.4 per cent for each degree centigrade. For this reason the air in high mountains and that in tropical regions have almost identical oxygen deficiencies. At 300 meters above sea level and at an average temperature of 15 C. (59 F.), about 10 per cent of the normal sea level oxygen supply is missing. The hitherto accepted view that oxygen deficiency develops only above 3,000 meters altitude is absolutely erroneous on the basis of these investigations. A tendency to goiter formation is already evident in the presence of a 10 per cent oxygen weight loss. An entirely new discovery was made in the course of thousands of

air analyses, namely that carbon dioxide derives chiefly from the respiratory activity of the plant world. Assimilation in the green plant does not take place automatically as long as there is light but is absolutely elective, depending on adaptation (sun plants and shadow plants). Forest trees, for instance, assimilate, as a rule, for only about six hours daily, and they produce carbon dioxide by exhalation for eighteen hours. The heavy carbon dioxide that is produced at night sinks down, and on inclining terrain or by water attraction it produces currents and even carbon dioxide lakes. It was newly discovered that a chemical affinity exists between water and carbon dioxide, so that cold water, particularly if it flows rapidly, carries with it by its power of attraction such carbon dioxide currents and puts them into accelerated movement. This explains many of the edemic goiter regions which are found in river valleys, delta regions, swamps and so on, in which stagnant water, when it becomes warmer, again discharges carbon dioxide if calcium formation has not taken place. Thus goiters are prevalent in some heavily forested regions of Russia, Canada and North America.

Other climatic factors play a part, particularly fog, in which the carbon dioxide always increases. Winds from large forests, which frequently have continuously the same direction as the nocturnal mountain winds, often increase the carbon dioxide content in the lowest air layers and thus make breathing difficult and promote goiter formation.

Besides these chief causes of goiter formation the nutritional metabolism plays a part, particularly the modification of the acid-base equilibrium in the direction of a tissue acidosis; for instance, by a meat or sugar diet. Sugar has an elective affinity for potassium. By extensive experiments on domestic animals, Duerst found that potassium, even in the form of bicarbonate, is capable of dissolving the colloid in the goitrous colloid gland, whereas the calcium salts cause stasis and hardening of the colloid. This explains the surprising results obtained by Webster, who was able to produce parenchymatous goiters in rabbits only during the winter by feeding them with various types of cabbage, whereas during summer the same diet produced normal glands; this is explained by the fact that in winter the potassium and acid content of the various types of cabbage is especially high. Nutrition and particularly mineral substances are of great significance in the pathogenesis of goiter.

These studies also demonstrate the importance of minerals in the soil, which was stressed repeatedly by the Swiss surgeon Eugen Bircher.

Duerst regards the nature of the soil and water and the topographic location of a community as the chief reasons for the localization of endemic goiter regions. The carbon dioxide content plays a part, particularly if the carbon dioxide currents pass human habitations. It is of interest that in villages in which goiter is endemic many houses remain free from goiter whenever the ventilation is good and the house is not in the carbon dioxide current.

Duerst concurs with the observations of Eugster as regards the heredity of goiters. A genotypic heredity is excluded, but a transmission of the existing biochemical metabolic milieu is possible and, in view of the continuation of the causal circumstances, goiters and even cretinism continue to develop. It is also proved that a specific infection cannot exist. Topography, housing, hygiene and the nutritional factors have to be considered in the prophylaxis. As regards treatment, in addition to iodine, potassium bicarbonate can be used in colloid goiters. For toxic goiters a carbon dioxide reduction of about 15 per cent is recommended; that is, the persons in question should live at an altitude 1,500 meters above that to which they are accustomed. Conversely, in colloid goiter the regular daily inhalation of oxygen and potassium medication have a favorable effect; also dietetic measures that induce acidosis.

Deaths

Percy Lancelot Jones * Colonel, United States Army, retired, Erie, Pa.; University of Tennessee Medical Department, Nashville, Tenn., 1897; veteran of the Spanish-American War; on July 10, 1903, was appointed a first lieutenant in the medical corps of the United States Army and was sent to the Army Medical School, graduating in 1904; was advanced through the grades, given a temporary promotion to colonel in the World War and reached that permanent grade on July 10, 1929; retired on his own request on Oct. 30, 1931; fellow of the American College of Surgeons; aged 66; medical director of the Hamot Hospital, where he died, August 9, of carcinoma of the larynx.

Emerson Megrail * Cleveland; Western Reserve University School of Medicine, Cleveland, 1915; associate professor of hygiene and bacteriology at his alma mater and member of its teaching staff since 1919; consultant laboratory director of the division of health of Cleveland; served in France during the World War as a captain in the medical corps; member of the Society of Bacteriologists; fellow of the American Public Health Association; aged 51; died, October 21, of coronary thrombosis.

Elmon Reuben Johnson * Quincy, Mass.; Boston University School of Medicine, 1895; clinical instructor in laryngology at his alma mater from 1921 to 1928 and instructor in clinical laryngology and rhinology, 1928-1929; fellow of the American College of Surgeons; formerly served on the staff of the Massachusetts Memorial Hospital, Boston; otolaryngologist, Quincy City Hospital; aged 70; died, October 30, of cerebral hemorrhage and arteriosclerosis.

Harold Franklin Taylor, Hartford, Conn.; University of Vermont College of Medicine, Burlington, 1917; member of the Vermont State Medical Association; formerly assistant professor of medicine at his alma mater; served during the World War; associate medical director of the Aetna Life Insurance Company; aged 51; died, October 22.

Otto Joachim * New Orleans; Memphis (Tenn.) Hospital Medical College, 1883; member of the American Laryngological, Rhinological and Otolological Society; fellow of the American College of Surgeons; consultant in otolaryngology, Baptist and Orleans Tuberculosis hospitals, Milne Home and Touro Infirmary; aged 77; died, October 27.

Eugene Wilson Skelton, Brooklyn; Long Island College Hospital, Brooklyn, 1901; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; surgeon emeritus, Norwegian Hospital; president of the Baptist Home; aged 70; died, October 30, in the Methodist Hospital of cystic kidney and uremia.

William C. Schultz, Waynesboro, Pa.; Jefferson Medical College of Philadelphia, 1895; member of the Medical Society of the State of Pennsylvania; past president of the Franklin County Medical Society; aged 72; on the staff of the Waynesboro Hospital, where he died, October 29, of nephritis.

Charles Wardell Heywood * Utica, N. Y.; Northwestern University Medical School, Chicago, 1896; on the staff of St. Elizabeth Hospital; at one time on the staff of the Cook County Hospital and Hospital of St. Anthony De Padua, Chicago; aged 70; died, October 31, of coronary thrombosis.

Howard William Salisbury, Dearborn, Mich., University of Michigan Medical School, Ann Arbor, 1927; member of the Michigan State Medical Society; on the staff of the Emergency Hospital of the Ford Motor Company; aged 40; died, October 19, in the Henry Ford Hospital, Detroit.

John Freeman Summerville, Monroe, Pa.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1881; member of the Medical Society of the State of Pennsylvania; past president and secretary of the Clarion County Medical Society; aged 84; died, October 25.

Anthony Thomas Weber * Chicago; National Medical University, Chicago, 1907; veteran of the Spanish-American and World wars; formerly on the staffs of the Veterans Administration Facility in Hines, Ill., and Tucson, Ariz.; aged 64; died in October of coronary occlusion.

Alexander Bradfield, Tillamook, Ore.; Detroit College of Medicine and Surgery, 1933; member of the Oregon State Medical Society; county health officer; aged 34; died, October 28, in St. Vincent's Hospital, Portland, of agranulocytic angina following the use of dinitrophenol.

James M. Marsh, Elkhorn, Wis.; New York Homeopathic Medical College and Hospital, New York, 1890; past president of the Walworth County Medical Society; for many years city public health officer; aged 79; died, October 31, in the Walworth County Hospital of uremia.

Morrow Beach Wilson, National Military Home, Ohio; Starling Medical College, Columbus, 1895; veteran of the Spanish-American War; aged 70; died, October 24, in the Veterans Administration Facility, Dayton, of arteriosclerosis, heart disease and diabetes mellitus.

Clyde Frederick Zapf, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1918; was on the staffs of the Women's Homeopathic Hospital, Salvation Army Home and Hospital and the Hahnemann Hospital; aged 45; died, October 23, of angina pectoris.

Theodore Ora Morris, Los Angeles; Central College of Physicians and Surgeons, Indianapolis, 1904; served during the World War; on the staff of the Veterans Administration Facility, West Los Angeles; aged 63; died, October 19, in San Diego of coronary occlusion.

Edward Bailey Beasley, Ruxton, Md.; Johns Hopkins University School of Medicine, Baltimore, 1906; received the degree of doctor of public health from Harvard University, Boston, in 1911; aged 59; died, August 30, of coronary occlusion and arteriosclerosis.

Carroll Deane Smith, Paterson, N. J.; University of Texas School of Medicine, Galveston, 1925; member of the Medical Society of New Jersey and the National Gastroenterological Association; aged 42; died, October 28, at the Mount Sinai Hospital, New York.

Lucius Frank Laverty Jr. * Bay City, Mich.; Harvard Medical School, Boston, 1927; served in the Navy during the World War; on the staffs of the Bay City General Hospital and the Mercy Hospital; aged 46; was killed, October 30, in an automobile accident.

James Homer Butler, Lincoln, Ill.; Missouri Medical College, St. Louis, 1899; member of the Illinois State Medical Society; on the staffs of the Evangelical Deaconess Hospital and St. Clara's Hospital; aged 66; died, October 31, of carcinoma of the sigmoid.

Irvin Cameron Stayer, Woodbury, Pa.; Medico-Chirurgical College of Philadelphia, 1901; member of the Medical Society of the State of Pennsylvania; for many years member of the board of education; bank president; aged 68; died, October 24, of lymphosarcoma.

Jarold Elting Kemp, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1921; member of the Central Society for Clinical Research; on the staff of the Johns Hopkins Hospital; aged 43; died, October 19, of acute coronary occlusion.

John Michael Leonard * Fall River, Mass.; College of Physicians and Surgeons, Baltimore, 1900; for many years president of the staff of St. Anne's Hospital; medical inspector of public schools; aged 65; died, October 26, of carcinoma of the rectum.

Floyd Lamar Abernethy, Foley, Ala.; University of Alabama School of Medicine, University, 1916; member of the Medical Association of the State of Alabama; served during the World War; aged 50; died, October 29, of coronary occlusion.

Benjamin Eugene Sanborn, Manchester, N. H.; Dartmouth Medical School, Hanover, 1911; member of the New Hampshire Medical Society; on the staff of the Elliot Hospital; aged 56; died, October 3, of carcinoma of the rectum and liver.

Wilmington Eldrich Shallowhorne, Kerrville, Texas; Flint Medical College of New Orleans University, New Orleans, 1906; aged 60; on the staff of the Kerrville State Hospital, where he died, October 18, of chronic interstitial nephritis.

Frank Calhoun Smith, Washington, D. C.; Memphis (Tenn.) Hospital Medical College, 1896; served during the World War; formerly on the staff of the Veterans Administration; aged 68; died, July 8, in the Veterans Administration Hospital.

James G. Trant, Richmond, Va.; Medical College of Virginia, Richmond, 1906; member of the Medical Society of Virginia; for many years medical examiner for the city public school system; aged 60; died, October 29, of cerebral hemorrhage.

Joseph Collier Ray, Whitakers, N. C.; University College of Medicine, Richmond, 1909; member of the Medical Society of the State of North Carolina; aged 58; died, October 29, in the Rocky Mount (N. C.) Sanitarium of coronary heart disease.

Ray Wallace Moe, Peekskill, N. Y.; College of Physicians and Surgeons, Baltimore, 1903; past president of the board of the Peekskill Hospital; aged 61; died, October 27, of carcinoma of the lung and rheumatoid arthritis.

Lawson Henry Recher, Morocco, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1879; member of the Indiana Medical Association; aged 85; died, October 11, of arteriosclerosis.

Joseph W. Maddox, Hillwood, Ala.; University of Tennessee Medical Department, Nashville, 1900; member of the Medical Association of the State of Alabama; aged 69; died, October 31, of coronary occlusion.

Louis James Loughlin, Carberry, Man., Canada; University of Manitoba Faculty of Medicine, Winnipeg, 1927; aged 39; died, October 31, in the Grace Hospital, Winnipeg, of gastric hemorrhage and pleurisy.

James T. Leigh, Du Quoin, Ill.; Missouri Medical College, St. Louis, 1882; member of the Illinois State Medical Society; on the staff of the Marshall Browning Hospital; aged 83; died, October 30, of senility.

Everett Lamont Bradley @ Pontiac, Mich.; George Washington University School of Medicine, Washington, D. C., 1920; aged 46; died, October 30, in the Pontiac General Hospital of acute hemorrhagic pancreatitis.

Edward P. Condon, Spokane, Wash.; John A. Creighton Medical College, Omaha, 1910; aged 56; died, October 23, of cerebral hemorrhage, pneumonia, coronary thrombosis and arteriosclerosis.

John Todd, Newport, Ky.; Medical College of Ohio, Cincinnati, 1900; member of the Kentucky State Medical Association; formerly health officer; aged 64; died, October 21, of heart disease.

McClellan Wilson, McAlester, Okla.; Ensworth Medical College, St. Joseph, Mo., 1894; member of the Oklahoma State Medical Association; aged 77; died, October 15, of cerebral hemorrhage.

Leonard H. Jacobsen @ Seattle; University of Minnesota College of Medicine and Surgery, Minneapolis, 1905; aged 60; died, October 4, of recurring coronary thrombosis and cholecystitis.

James Brown McClendon, Birmingham, Ala.; Rush Medical College, Chicago, 1933; member of the Medical Association of the State of Alabama; aged 33; died, October 29, of heart disease.

Horace Fleckenstine @ Newportville, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1896; aged 63; died, October 31, of diabetes mellitus and cardiorenal disease.

John Milton Boyd @ Washington C. H., Ohio; Starling Medical College, Columbus, 1904; aged 82; died, October 28, in the White Cross Hospital, Columbus, of cerebral hemorrhage.

Bela David Thomas, Dallas, Texas; Kansas City (Mo.) College of Medicine and Surgery, 1917; served during the World War; aged 56; died, October 12, of coronary occlusion.

Jacob A. Wagner, Bland, Va.; Medical College of Virginia, Richmond, 1901; for many years superintendent of the county schools; aged 80; died, October 15, of pernicious anemia.

Charles Herbert Sangster, Buffalo; University of Buffalo School of Medicine, 1895; for many years principal of several city schools; aged 82; died, October 20, of myocarditis.

Clarence Harmon Ellis, Phoenix, Ariz.; Homeopathic Hospital College, Cleveland, 1887; aged 81; died, October 13, in the Good Samaritan Hospital of coronary occlusion.

Ralph Dwight Quillen, Baltimore; College of Physicians and Surgeons, Baltimore, 1909; aged 57; died, October 20, in a local hospital of arteriosclerosis and heart disease.

Alfred Daudelin, Nashua, N. H.; Baltimore Medical College, 1908; member of the New Hampshire Medical Society; aged 63; died, September 13, of cardiorenal disease.

Thomas Art Smith, Charlotte, N. C.; North Carolina Medical College, Charlotte, 1917; aged 51; died, October 18, in the Mercy Hospital of coronary thrombosis.

Theodore Lincoln Hazard, Iowa City, Iowa; University of Michigan Homeopathic Medical School, Ann Arbor, 1883; aged 81; died, October 31, of heart disease.

Wyatt S. Miles, Crockett, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1890; aged 75; died, October 9, of cerebral hemorrhage.

George H. Craft, Newark, N. Y.; University of Buffalo School of Medicine, 1896; aged 67; died, September 1, of cerebral hemorrhage and arteriosclerosis.

Charles Clinton Cooley, Chicago; Jenner Medical College, Chicago, 1915; also a dentist; aged 60; died, October 12, in Warrenville, Ill., of coronary thrombosis.

Jane Kelsey Todd, Portland, Ore.; Northwestern University Woman's Medical School, Chicago, 1898; aged 73; died, October 3, of myocarditis and pneumonia.

John Ignatius McGonigle, Oklahoma City; Beaumont Hospital Medical College, St. Louis, 1901; aged 75; died, October 10, of coronary thrombosis.

Eugene A. Woods, Sarasota, Fla.; University Medical College of Kansas City, Mo., 1898; aged 65; died, September 27, of fibroid pulmonary tuberculosis.

John A. Rickert @ Allegan, Mich.; Detroit College of Medicine and Surgery, 1921; aged 46; died, October 9, in Detroit of chronic myocarditis.

James Bones Wright, Augusta, Ga.; University of Georgia Medical Department, Augusta, 1888; aged 79; died, October 8, of cardiovascular renal disease.

William Ladell Edgar @ Athol, Mass.; Hahnemann Medical College and Hospital of Philadelphia, 1894; aged 68; died, October 11, of endocarditis.

Albert D. Mock, Marion, Ind.; Curtis Physio-Medical Institute, Marion, 1888; aged 76; died, October 24, of myocarditis and arteriosclerosis.

John B. Kersey, Cincinnati; Pulte Medical College, Homeopathic, Cincinnati, 1885; aged 79; died, October 23, of carcinoma of the intestine.

H. W. Glasscock, Smithfield, Ky.; University of Louisville (Ky.) Medical Department, 1875; aged 85; died, October 10, of coronary occlusion.

Andrew Charles Callahan, Buffalo; Ohio Medical University, Columbus, 1905; aged 60; died, October 11, of myocarditis and coronary sclerosis.

William S. Frye, New Kensington, Pa.; Physio-Medical College of Indiana, Indianapolis, 1882; aged 82; died, October 30, of arteriosclerosis.

Otto L. Von der Au, St. Louis; Beaumont Hospital Medical College, St. Louis, 1892; aged 71; died, October 4, of cerebral hemorrhage.

Charles Joseph Sager, Woodstock, Va.; Medical College of Virginia, Richmond, 1898; aged 68; died, October 24, of cerebral hemorrhage.

Vernon Leslie Litsinger, Farnham, Va.; Maryland Medical College, Baltimore, 1912; aged 58; died, October 14, of heart disease.

William Wylie Nasmyth, Sylvan Lake, Alta., Canada; Trinity Medical College, Toronto, Ont., 1889; aged 75; died, September 6.

Homer Burton Curtis, Kansas City, Mo.; Barnes Medical College, St. Louis, 1901; aged 69; died, October 2, of cerebral hemorrhage.

Frank Joseph Schwarz @ St. Louis; Bennett Medical College, Chicago, 1915; aged 64; died, October 28, of bronchopneumonia.

Charles Cornelius Langsdorf, Seffner, Fla.; Bellevue Hospital Medical College, New York, 1894; aged 73; died, October 7.

George Hal Williamson, Port Austin, Mich.; Chicago College of Medicine and Surgery, 1913; aged 56; died, October 18.

Joseph Watkins Yard, Long Beach, Calif.; Bellevue Hospital Medical College, New York, 1884; aged 83; died, October 27.

George Allan Anderson, Calgary, Alta., Canada; Trinity Medical College, Toronto, Ont., 1900; aged 71; died, September 27.

Michael Krantz @ Boston; Middlesex University School of Medicine, Waltham, Mass., 1921; aged 59; died, September 4.

James Edwin Blickensderfer, Lebanon, Mo.; Barnes Medical College, St. Louis, 1896; aged 74; died, October 19.

Claxton Perry Binford, Huntsville, Ala.; Meharry Medical College, Nashville, Tenn., 1927; aged 41; died, October 3.

James Guard Fisk, Venice, Calif.; Medical College of Indiana, Indianapolis, 1892; aged 73; died in September.

Correspondence

TRANSFUSION OF BLOOD AND BLOOD SUBSTITUTES

To the Editor:—In the editorial "Transfusion of Blood and of Blood Substitutes" (THE JOURNAL, Nov. 8, 1941, p. 1627) you state that "Hustin of Belgium proposed in 1914 a method of collecting blood in a vessel containing an equal amount of a solution of 5 per cent dextrose in 9 per cent of sodium chloride and sodium citrate in the amount of 20 cc. for each hundred cubic centimeters of blood. The method was used on a rather large scale by the Entente forces during World War I."

It is correct that Hustin was the first to try sodium citrate in blood transfusion. However, he thought that in order to prevent coagulation it was necessary to use strongly diluted blood. He mixed (Note sur une nouvelle methode de transfusion, *Bull. Soc. roy. d. Sc. méd. de Bruxelles* 72:104 [April 6] 1914) 150 cc. of blood with 150 cc. of a dextrose-sodium citrate solution. Thus for a blood transfusion of average size (500 cc.) an equal amount (500 cc.) of dextrose-sodium citrate solution had to be added. It is perfectly clear that blood in such strong dilution loses the vital qualities of pure blood. Furthermore, the introduction of a quart of fluid might overtax the circulation.

As far back as 1918 Hédon (Note complémentaire sur la transfusion du sang citraté, *Presse méd.* 26:57 [Jan. 31] 1918) pointed out that "Hustin's method was really an infusion of a strongly diluted blood mixed with sodium citrate and dextrose."

The citrate method of blood transfusion became a practical method and was used, as you state in your editorial, on a rather large scale in World War I, when Agote (Nuevo procedimiento para la transfusion del sangre, *An. Inst. Modelo de clin. méd.*, January 1915) and I (A New and Greatly Simplified Method of Blood Transfusion, *New York M. Rec.* 87:141 [Jan. 23] 1915) independently and contemporaneously showed that addition of a small quantity of citrate solution was sufficient to prevent coagulation of the blood. I used 50 cc. of a 2.5 per cent solution for 450 cc. of blood and Agote used 5 cc. of a 25 per cent stock solution.

Neither Agote nor I knew of Hustin's work when we published the description of our methods. The World War had started in August 1914 and interrupted exchange of medical literature between Europe and this country.

Hustin's work presented an interesting experiment but not a solution of the problem. For this reason it cannot deserve more than a certain historical interest.

RICHARD LEWISOHN, M.D., New York.

"THERE IS NOTHING PHYSICALLY THE MATTER" (CONTINUED)

To the Editor:—Dr. Roy Grinker's communication in THE JOURNAL, October 18, deserves wide attention and comment. The physician's attitude toward patients with nervous symptoms generally reflects discredit on the medical profession. The reasons for that attitude should give us pause.

Most physicians have little difficulty in recognizing anxiety states and the various organ neuroses. Even when the diagnosis is made by the exclusion method alone, our correct percentages are satisfactorily high. However, when a diagnosis of psychoneurosis has been established there seems often to be little advice that can be given which is of real or lasting benefit. The patient is usually left more confused than ever, for he is frequently told, against his own better judgment, that "there is nothing physically the matter" or "nothing seriously wrong." Both of these considered opinions are erroneous. Nervous disorders are invariably accompanied by measurable disturbances

of physiology. At first functional and reversible, these disturbances readily persist and cause structural organic diseases that are demonstrable by physical and laboratory examinations.

As physicians, we dislike and dismiss "neurotics" because we are not equipped by instruction or experience to treat them. They often represent our failures: the skeletons in our medical closets. It takes much time to listen to their many complaints, patience to brook their "resistance" and a very definite plan to combat their aggressiveness and lead them away from an emotional to a rational and realistic outlook on life. Yet these hardships are a part and parcel of our heritage as physicians. If we cannot find time or heart for this phase of our work, the least that we can do is to recognize our responsibility and reputation as physicians and instruct the patient as to where advice may be found.

Medicine knows no limits to its objectives; those objectives are to improve the total health and welfare of all the people. Neither in their own nor in the public's eyes do physicians restrict their capacity to give generous advice. The healing of the sick is a science that can exclude no part of the body. Must it continue to be said of us after twenty-four hundred years of science that "it is the great error of our day in the treatment of the human body that physicians separate the soul from the body"? So neglectful and indifferent an attitude will deprive us of that confidence which our many sacrifices have shown us to deserve and deny hope to many sick people who may reasonably expect hope from rational and courageous treatment.

ANDREW D. HART JR., M.D., Charlottesville, Va.

HEALTH OF SHARECROPPERS

To the Editor:—The article in THE JOURNAL, July 5, by Dr. J. W. Thompson on the clinical status of a group of Negro sharecroppers provokes discussion. An evaluation of the health of Negro sharecroppers is made on the basis of a sample of 24 subjects on whom a history was taken and a physical examination made. The data gleaned by the author seemed to indicate a dangerous state. Yet he concludes that he doubts that the "Negro sharecroppers are apt to be in a lamentable state of ill health." Finally he states that all but 1 were in good general condition and not far below the excellence found in a group of Harvard students—who did not show a single abnormal finding.

I recapitulate Dr. Thompson's observations: pyorrhea in 50 per cent, syphilis in 8 per cent, pellagra in 4 per cent, pulmonary signs—not investigated—in 8 per cent, possible heart disease in 4 per cent, gonorrhea in 63 per cent and gonorrheal arthritis in 12 per cent.

Infant mortality figures were five times as great as those among white persons. The group was 10 per cent under ideal weight and 4.5 per cent under ideal height.

As a supererogatory gesture the author quotes another piece of research to show that Negroes can endure hard labor better than the white race.

A sincere interest in the health of Negro sharecroppers demands an excellence of medical research.

JOSEPH M. KRIMSKY, M.D., Brooklyn.

[This letter was referred to Dr. John W. Thompson, Toronto, who replies:]

To the Editor:—The two serious diseases which were found prevalent in the histories of the Negro sharecroppers were gonorrhea and malaria. All these subjects had been under medical care and, as far as one could determine, had been cured. That they had been adequately treated and had recovered is not deplorable. Two subjects showed positive Wassermann reactions, and 1 of these was not a sharecropper. However, accept-

ing the figure of 8 per cent, Roberts and Williams (*South. M. J.* 30:458 [May] 1937) report an incidence of 11.7 per cent in the white population of Gibson County in Tennessee, and Usilton (*Pen. Dis. Inform.* 16:147 [May] 1935) estimates that 8 per cent of males from 20 to 30 years of age contract syphilis. I cannot regret the fact that the figure for the Negroes is, if anything, lower than that for the white population. That the cardiac and respiratory signs found on clinical examination were without significance was shown by the excellent ability of these subjects to transport oxygen—a performance which is quite incompatible with either cardiac or respiratory disease. That the infant mortality was five times as great as that found in the "control" series is indeed a large difference but scarcely one which would necessarily damage the health of the surviving members to which the article had reference. As to weight, it would be more correct, in all probability, to state that the Harvard students were 10 per cent above rather than that the Negro was 10 per cent under ideal weight; the difference in weights is what one might expect between groups composed of sedentary individuals, on the one hand, and physically active individuals on the other. I can say nothing with reference to the difference of 8 cm. in the relative heights other than to suggest as an explanation a difference in anthropologic characteristics and to confess ignorance as to its diagnostic significance. In order to determine the physical fitness of an individual there is obviously no better way than to measure his capacity to perform a task whose standard of execution is known to be commensurate with physical fitness. This was done with the Negro whose performance would be the envy of those desirous of being fit. If reference to this fact is looked on as a "supererogatory gesture," its significance has not been understood.

JOHN W. THOMPSON, M.B., University of Toronto.

DIETARY HEALING OF DENTAL CARIES

To the Editor:—In *THE JOURNAL*, September 27, the editorial on dietary healing of dental caries seems to be misleading and not in conformity with the article from which the information was secured. To quote from *Science* of June 27, 1941: "The dentine had a sclerotic appearance and beneath every place where the outer part of the tooth had been subjected to attack a new, thick layer of secondary dentine had been laid down. . . ." This statement is quite different from the one made in the editorial—"the exposed tooth was found covered by a thick layer of secondary dentine more or less filling the earlier cavity."

HOUGHTON HOLLIDAY, New York.

Associate Dean, School of Dental and Oral
Surgery of Columbia University.

To the Editor:—In the September 27 issue, page 1099, appears an editorial entitled "Dietary Healing of Dental Caries." The opinions clearly reveal that some one has disseminated misleading interpretations of a physiologic process previously described.

A careful reading of Sognnaes' paper in *Science* reveals a tendency on the part of the author to wishful thinking when he applies the term reparative process to what is obviously the deposition of secondary dentin. The person who wrote the editorial certainly went Sognnaes one better with his statement that secondary dentin more or less filled the earlier cavity. Secondary dentin forms in all rats' teeth subject to wear and frequently in rats' teeth that are not subject to wear, regardless of the presence or absence of dental caries. Hoffman and Schour (*Am. J. Orthodontics* 26:854 [Sept.] 1940) have described this process in mathematically exact terms. Their work, coupled with mine, explain what happened to Sognnaes' carious process: it was worn off when the diet was changed, not repaired or healed; the dentin that remained was secondary

dentin or uninjured primary dentin. Hoffman makes the statement that this process is not common in human teeth. To sum up, at the present time no one has adequately demonstrated that carious lesions may be repaired or healed or that regenerative processes take place in necrotic dentin.

S. S. ARNIM, Richmond.

School of Dentistry Medical College of Virginia.

NOTE.—It was shown in 1936 by Arnim and his associates (Arnim, S. S.; Clarke, M. F.; Anderson, B. G., and Smith, A. H.: Dental Changes in Rats Consuming Diet Poor in Inorganic Salts, *Yale J. Biol. & Med.* 9:117 [Oct.] 1936) of Yale University that alterations in the internal histologic structure of the molar teeth of rats are produced by diets deficient in phosphorus, calcium and other inorganic salts. Initial reparative processes were described following the addition of adequate mineral salts to the deficiency diets. The essential point in Sognnaes' paper "Dietary Repair of Experimental Caries" (*Science* 93:617 [June 27] 1941) is his description of an even more effective reparative process in externally produced dental caries when the carious rats are placed on a non-caries producing luxury diet. Whether or not the two reparative processes are identical cannot be told without additional histologic study. It should be emphasized, however, that both investigators worked with rapidly growing young rats.—En.

WEIL'S DISEASE

To the Editor:—In referring to your editorial on Weil's disease (*THE JOURNAL*, Oct. 11, 1941, p. 1266), permit me to make one suggestion. In speaking of the laboratory tests in the diagnosis, the editorial states that ". . . dark field examination of centrifuged blood during the first stage and of the urine after the tenth day are the most important." Unfortunately, in practice the pitfalls involved in the direct examination of blood by dark field illumination are such that little reliance can be placed on this method alone, even by experienced laboratory workers.

Recently I had occasion to speak with Dr. E. A. Fennel of Honolulu on this very subject. I had just completed a study on canine leptospirosis (*Canine Leptospirosis in Pennsylvania, J. Infect. Dis.* 69:131-137 [Sept.-Oct.] 1941). In this study numerous blood specimens were examined serologically (agglutination-lysis test) and also by direct dark field illumination of centrifuged blood for evidence of leptospirosis. Fortunately, it was early decided that what it was thought were *Leptospira* in many instances were actually filaments of red blood cell or of platelet origin. Dr. Fennel and his co-workers had a similar experience in Hawaii (Weil's Disease and Artefacts, *Proc. Staff Meet. Clinic, Honolulu* 4, March 1938). During an extensive study of human leptospirosis, the great number of positive reactions as demonstrated by dark field illumination of blood became alarmingly suggestive. This led to a thorough investigation in which normal controls were used. Finally it was decided that they were dealing with artefacts possibly derived from fibrin shreds, platelets, red cell stroma or reticulum. It was Dr. Fennel's conclusion that it was dangerous to make a positive diagnosis of Weil's disease by dark field examination of blood or urine of patients unless supported by confirmatory evidence (i. e. animal inoculation of blood or urine at the proper stage of the disease). Recent studies have demonstrated that the agglutination-lysis test on the patient's serum, beginning with the tenth day of the disease, is probably a quicker means to a diagnosis than animal inoculation—guinea pigs rarely show evidence of the disease, show jaundice or succumb to the infection before a week or ten days from the time of inoculation.

CLARA RAYEN, M.D., Youngstown, Ohio.

serious injury. Subsequently the plaintiff sued the defendant physician, the assistant surgeon who had supervised the operation performed by the intern, for damages, and from an adverse judgment he appealed to the Supreme Court of Errors of Connecticut.

The plaintiff contended that the defendant, having been present at and assisted in the operation, was guilty of gross misconduct in failing to render adequate after-care to the plaintiff and in allowing the after-care to pass into the hands of other physicians. The plaintiff, said the Supreme Court of Errors, to recover must prove that the defendant failed to exercise the degree of care, skill and diligence ordinarily exercised by physicians and surgeons in the same line of practice in the general neighborhood of Hartford. Since there was no claim of negligence in connection with the operation itself, the plaintiff must show that the defendant was under some legal obligation to treat the patient after the operation and that he failed to satisfy that obligation. The evidence showed that the defendant was regularly on duty in the women's ward, not the ward in which the plaintiff was a patient. He had been assigned merely to assist the intern and "except for being present at the operation had no connection with the plaintiff's care or treatment." When the operation was over, the plaintiff was returned to the care of the physician in charge of his own ward. There was no special contract whereby the defendant agreed to treat the plaintiff during his hospitalization. A surgeon who assists at an operation, continued the Court, is not, in the absence of a specific contract, liable for the rendering of after-care. In such a case the surgeon may rely on the custom of the hospital in divorcing the operation from the after-care. Furthermore, in this day and age when it is well known that there are physicians and surgeons of special skill in particular branches of their profession, it cannot safely be announced as a general rule of law, applicable to a case of this nature, that a surgeon who performs an operation is liable for the negligence of other physicians, nurses or interns in hospitals in the after-treatment unless the evidence shows that he specially undertakes such employment. The judgment for the defendant was accordingly affirmed.—*Sheridan v. Quarrier*, 16 A. (2d) 479 (Conn., 1940).

Malpractice: Alleged Erroneous Diagnosis of Gonorrhea.—One of the plaintiffs consulted the defendant physician relative to an itching in the region of her vagina. The physician took her history, made a smear from the vagina, urethra and cervix and after a microscopic examination of the smear (referred to in the reported decision as the methylene blue test) made a diagnosis of gonorrhea and so informed his patient, asking that her husband, the other plaintiff, consult him. The physician then instituted sulfanilamide therapy on the wife. When the husband consulted the physician, the physician was unable to obtain a smear from the entrance of the husband's urethra but "obtained an imprint" which did not reveal evidence of gonorrhea on microscopic examination. He informed the husband that he doubted whether he had gonorrhea but advised immediate treatment. The husband, however, never returned for treatment. Later both plaintiffs consulted another physician, who made smears and sent them to a laboratory for examination, which after making a test referred to in the reported decision as a "gram negative stain" test reported "negative" specimens. Then the second physician determined that neither the husband nor the wife had gonorrhea. The plaintiffs thereafter sued the defendant physician for malpractice. Shortly after the institution of the action the defendant physician sent the slide containing the smear he had taken from the wife to two laboratories, both of which performed the "gram negative stain" test and reported a "positive reaction showing gonococci." From a judgment in favor of the physician the plaintiffs appealed to the district court of appeal, second district, division 2, California.

The first question for the appellate court's determination was whether the evidence before the trial court was sufficient to sustain a judgment in favor of the physician and against the wife. A physician and surgeon, said the court, is not required to make a perfect diagnosis but is required to have only that degree of skill and learning ordinarily possessed by physicians

of good standing practicing in the same locality and to use ordinary care and diligence in applying that learning to the treatment of his patient. The evidence in this case discloses that it was the ordinary practice of physicians and surgeons in the community in which the defendant physician practiced in making a diagnosis of gonorrhea to use either the methylene blue test or the gram negative stain test. In this case the evidence discloses that at the time the wife consulted the defendant physician he made the methylene blue test, which showed the patient suffering from gonorrhea. Subsequently, the same slides were submitted by him to two independent laboratories where gram negative stain tests were made showing the presence of gonococci. It therefore appears that there was substantial evidence to support the finding of the trial court that the defendant physician had used the requisite skill in diagnosing the wife's complaint, and a judgment in favor of the physician was proper.

The next question the court was called on to determine was whether or not the evidence before the trial court was sufficient to sustain a judgment in favor of the physician and against the husband. The appellate court concluded likewise that the judgment in favor of the physician was proper. The evidence is clear, said the court, that the physician after examining the husband told him that he did not think he was suffering from gonorrhea but recommended that he return for further examination and treatment, which the husband refused to do. Obviously the physician's conduct relative to the husband was proper and not actionable.

For the reasons stated, the judgment in favor of the physician was affirmed.—*Ries v. Reinard*, 117 P. (2d) 386 (Calif., 1941).

Intoxication: Refusal of Defendant to Submit to Blood Test Admissible in Evidence.—The fact, said the Supreme Court of Iowa, that a defendant accused of operating a motor vehicle while intoxicated declined shortly after his arrest to submit to a blood test to determine whether or not he was intoxicated is admissible in evidence and may be considered by the jury as a circumstance, with all other facts and circumstances developed at the trial, in determining whether or not he was intoxicated at the time in question. While a defendant cannot be compelled to testify, under the practice in Iowa courts his refusal to testify can be considered and commented on. If he cannot be compelled to submit to a blood test, it is because he cannot be compelled to give evidence. Since his refusal to give evidence by testifying can be considered, his refusal to give evidence by submitting to a blood test can likewise be considered. The Iowa constitution contains no express provision prohibiting self incrimination, and the only constitutional provision that would appear to guarantee such protection is the due process clause, which in the opinion of the court does not render inadmissible testimony that the defendant refused to submit to a blood test. It is proper, continued the court, to show the defendant's conduct, demeanor and statements, whether oral or written, his attitude and relations toward the crime, if there was one, and the weight of these circumstances is for the jury to determine. The fact that the defendant declined to submit to a blood test is such a circumstance as may be shown for the consideration of the jury.—*State v. Benson*, 300 N. W. 275 (Iowa, 1941).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, Jan. 12-13. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Diveley, 1103 Grand Ave., Kansas City, Mo., Secretary.
- American Association for the Study of Neoplastic Diseases, Washington, D. C., Dec. 18-20. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.
- Puerto Rico, Medical Association of, Santurce, Dec. 11-14. Dr. David E. Garcia, P. O. Box 3866, Santurce, Secretary.
- Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Southern Surgical Association, Pinehurst, N. C., Dec. 9-11. Dr. E. M. Ochsner, 1430 Tulane Ave., New Orleans, Secretary.

Current Medical Literature

AMERICAN

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Titles marked with an asterisk (*) are abstracted below.

Annals of Internal Medicine, Lancaster, Pa.

15:347-628 (Sept.) 1941

- Blood Pressure Reducing Property of Extracts of Kidneys in Hypertensive Patients and Animals. I. H. Page, O. M. Helmer, K. G. Kohlstaedt, G. F. Kempf, W. D. Gambill and R. D. Taylor, Indianapolis.—p. 347.
- Results from Management of Bleeding Gastric and Duodenal Ulcer. T. G. Miller, Philadelphia.—p. 390.
- *Weil's Disease: Report of Six Cases. H. K. Rathbun and J. M. Waghelstein, Baltimore.—p. 395.
- Diagnosis and Management of Brucellosis. W. M. Simpson, Dayton, Ohio.—p. 408.
- Sulfonamide Therapy of Staphylococcal Septicemia. R. G. Torrey, Philadelphia; L. A. Julianelle, St. Louis, and H. G. McNamee, Philadelphia.—p. 431.
- Value of Sternal Marrow Aspiration as Method of Bone Marrow Biopsy. E. H. Falconer and M. E. Leonard, San Francisco.—p. 446.
- Changes in Cardiac Shadow Following Pharmacologic "Shock" Therapy of Schizophrenia. H. W. Sterling, Little Rock, Ark., and C. N. Baganz, Lyons, N. J.—p. 459.
- Electrocardiographic Changes in Stab and Gunshot Wounds of Heart, with Review of Literature. J. Solovay, G. D. Rice, Camp Custer, Mich., and H. U. Solovay, Brooklyn.—p. 465.
- Tachycardia and Sensitivity to Heat as Indications for Basal Metabolic Rate Determination. A. Ravin, Denver.—p. 478.
- Clinical Studies with Aid of Radio Phosphorus: IV. Retention in Blood, Excretion and Therapeutic Effect of Radio Phosphorus on Patients with Leukemia. L. A. Erl, L. W. Tuttle and J. H. Lawrence, Berkeley, Calif.—p. 487.
- *Symptomatic Hemolytic Anemia. K. Singer and W. Dameshek, Boston.—p. 544.
- Experimental Exophthalmos and Associated Myopathy Induced by Thyrotropic Hormone. R. B. Aird, San Francisco.—p. 564.
- Responsibility of American College of Physicians for Postgraduate Training. E. L. Bortz, Philadelphia.—p. 582.

Weil's Disease.—Rathbun and Waghelstein suggest that in this country Weil's disease would probably be diagnosed more frequently if the illness were considered in the differential diagnosis of jaundice of unknown cause or any obscure illness characterized by muscle pains, conjunctivitis and sudden unexplained fever. The final diagnosis rests on the results of the laboratory procedures. Agglutination reactions and guinea pig inoculations with blood and urine are diagnostic aids. The history of contact with the urine of wild rats is a valuable aid. Leukocytosis and albuminuria are important points in differentiating Weil's disease from catarrhal jaundice. Probably the most noteworthy feature of the disease is the extreme apathy of the patients. This was an outstanding characteristic of 4 of the 6 patients whom the authors encountered within twenty months. One patient admitted with jaundice and azotemia was thought to be suffering from acute yellow atrophy, suggesting that any similar patient with jaundice of unknown cause should be thoroughly investigated for the possibility of Weil's disease. Age, cardiac function and the presence or absence of uremia and jaundice influence the prognosis. The older the patient the more grave the prognosis. The fatality rate for patients without jaundice is negligible. Uremia has an unfavorable influence on the prognosis, particularly if oliguria or anuria is present. An active immunity may be produced by the injection of killed organisms, and Inada and his associates reduced the fatality rate from 30.6 to 17.3 per cent with immunized horse and human convalescent serums. A high carbohydrate-low fat diet might prove beneficial in the treatment of patients with jaundice.

Symptomatic Hemolytic Anemia.—Singer and Dameshek present 7 cases of benign and malignant neoplasms concomitant with hemolytic anemia, or symptomatic hemolytic anemia. The symptoms and signs of the anemia are a combination of the

hemolytic process and the underlying disease. The associated diseases in their 7 patients were dermoid cyst, chronic lymphatic leukemia, Hodgkin's disease, lymphosarcoma, severe hepatic disease and pneumonia with a panagglutinin. Spherocytosis and increased hypotonic fragility are often present in cases of symptomatic hemolytic anemia, although a "pseudomacrocytic" blood picture may be present. The spherocytosis may mean that the abnormality is due to undefined hemolyzing agents. The recognition of these cases is of importance in evaluating the type of anemia present in certain cases of lymphomatous disease and in ruling out an "idiopathic" hemolytic process. Splenectomy may be valueless, but treatment of the underlying process may be curative. The recognition of these cases further supports the hypothesis that various hemolytic agents, usually acting through the spleen, are responsible for hemolytic anemias.

Annals of Otol., Rhin. and Laryngology, St. Louis

50:629-966 (Sept.) 1941. Partial Index

- Infection as Cause of Fibrosis of Esophagus. H. P. Mosher, Marblehead, Mass.—p. 633.
- Early Diagnosis of Carcinoma of Esophagus. J. R. Lindsay, Chicago.—p. 675.
- Adenocarcinoma of Larynx. G. B. New and J. B. Erich, Rochester, Minn.—p. 706.
- Chondroma of Larynx: Report of Case. H. B. Orton, Newark, N. J.—p. 715.
- Treatment of Cancer of Larynx with Emphasis on Conservatism. F. A. Figi, Rochester, Minn.—p. 723.
- Laryngeal Tuberculosis with Some of the More Recent Advances in Treatment. F. R. Spencer, Boulder, Colo.—p. 735.
- Laryngeal Tuberculosis: Study of 500 Cases of Pulmonary Tuberculosis with Résumé Based on Twenty-Eight Years of Experience. J. P. Dworetzky, Liberty, N. Y., and O. C. Risch, New York.—p. 745.
- Laryngeal Tumors—Voice Recordings Before and After Operation. M. Eguen, Atlanta, Ga.—p. 776.
- Carotid Sinus Syndrome. M. F. Jones and J. M. Converse, New York.—p. 806.
- Histopathologic Changes Occurring in Chronic Infection of Pharynx. H. P. Schenck, Philadelphia.—p. 817.
- Vegetal Foreign Bodies in Bronchi: Analysis of Forty Cases. L. G. Richards, Boston.—p. 860.

Annals of Surgery, Philadelphia

114:481-800 (Oct.) 1941. Partial Index

- *Results of Partial Gastrectomy for Bleeding Duodenal, Gastric and Gastrojejunal Ulcer. W. Walters and W. H. Cleveland, Rochester, Minn.—p. 481.
- Gastric Ulcer: Significance of This Diagnosis and Its Relationship to Cancer. A. W. Allen and C. E. Welch, Boston.—p. 498.
- Massive Gastric Hemorrhage, with Special Reference to Peptic Ulcer. J. V. Bohrer, New York.—p. 510.
- Surgery in Peptic Ulceration of Stomach and Duodenum in Infants and Children. C. E. Bird, Providence, R. I.; Margaret A. Limper, Louisville, Ky., and J. M. Mayer, Mayfield, Ky.—p. 526.
- *Fifty-Two Proved Cases of Carcinoma of Pancreas and Ampulla of Vater, with Special Reference to Fatty Infiltration of Liver. J. G. Schindorf and T. G. Orr, Kansas City, Kan.—p. 603.
- Aseptic, Immediate Anastomosis Following Resection of Colon for Carcinoma. J. H. Gibbon Jr. and Clare C. Hodge, Philadelphia.—p. 635.
- *Chronic Ulcerative Colitis: Summary of Evidence Implicating Bacterium *Neorophorum* as Etiologic Agent. L. R. Dragstedt, G. M. Dack and J. B. Kirsner, Chicago.—p. 653.
- Intestinal Antisepsis, with Special Reference to Sulfanilylguanidine. W. M. Firor and E. J. Poth, Baltimore.—p. 663.
- Syndrome of Mesenteric or Subperitoneal Hemorrhage (Abdominal Apoplexy). G. F. Cushman and A. R. Kilgore, San Francisco.—p. 672.
- Experimental Production of Chronic Cholecystitis by Obstructive Lesions of Cystic Duct. W. H. Cole, M. V. Novak and E. O. Hughes, Chicago.—p. 682.
- Cerebrospinal Rhinorrhea: Surgical Repair of Craniosinus Fistula. A. W. Adson, Rochester, Minn.—p. 697.
- Surgery of Hyperparathyroidism: Occurrence of Parathyroids in Anterior Mediastinum and Division of Operation into Two Stages. O. Cope, Boston.—p. 706.
- Total Thoracic and Partial to Total Lumbar Sympathectomy and Celiac Ganglionectomy in Treatment of Hypertension. K. S. Grimson, Chicago.—p. 753.
- *Ascorbic Acid and Human Wound Healing. C. C. Lund and J. H. Crandon, Boston.—p. 776.
- Effect of Local and Oral Administration of Cod Liver Oil on Rate of Wound Healing in Vitamin A Deficient and Normal Rats. H. Brandaleone and E. Papper, New York.—p. 791.

Bleeding Peptic Ulcer.—Walters and Cleveland state that their results with partial gastrectomy performed during 1932 to 1936 inclusive support the premise that this operation offers the best chance of cure or amelioration of symptoms of bleeding peptic ulcer and the best prophylaxis against further hemor-

rhage. When the procedures which have proved of least merit are eliminated results should be improved. Thus, among the 119 patients who had resections in 1940 for bleeding peptic ulcer the pyloric antrum was removed in all but 1 and the posterior Pólya type of resection and anastomosis was employed in 94.1 per cent. The 1940 results should be superior. During the 1932 to 1936 period, seven pyloric antrums were not removed and only 75 per cent of the partial gastrectomies were of the posterior Pólya type.

Carcinoma of Pancreas.—Schnedorf and Orr review the records of the 35 cases of primary carcinoma of the pancreas and the 17 of the ampulla of Vater encountered at the University of Kansas Hospitals during the last twenty years. Only cases in which the diagnosis was proved at necropsy or by surgical biopsy are included. The disease was rapidly fatal in most patients. Thorough study of the function of the pancreas is advisable for the diagnosis of an early obscure cancer of the pancreas or of the ampulla of Vater in all patients with inexplicable abdominal complaints. Radical resection offers the only hope for cure. Palliative operation is indicated in cases of advanced disease. Fatty infiltration and hepatic degeneration were found at necropsy in 10 of the 52 patients. On the basis of experimental evidence the feeding of lecithin, choline, pancreatic extract or lipocaic is indicated in the preoperative and postoperative treatment of such patients to prevent fatty changes in the liver and to maintain life.

Chronic Ulcerative Colitis.—As a result of their study of the problem of chronic ulcerative colitis carried on in the departments of surgery, bacteriology and medicine of the University of Chicago during the last eight years Dragstedt and his associates are convinced that *Bacterium necrophorum* plays an etiologic role in the disease. They present the following evidence in support of their contention: 1. It is the predominant organism in the isolated colon in ulcerative colitis during exacerbations, and it disappears during periods of spontaneous quiescence. 2. It has been found in most cases of typical ulcerative colitis. 3. Specific antibodies for it have been found in the blood of patients with chronic ulcerative colitis and not in the blood of normal persons. 4. The organism is pathogenic for rabbits. 5. The literature indicates that it is similar to if not identical with *Bacillus* or *Bacteroides funduliformis*, repeatedly associated with necrotic lesions of the mucous membranes in man and with *Bacillus necrophorus*, which is believed to cause various necrotic lesions in domestic animals. *Bacterium necrophorum* is probably present in the normal alimentary tract of man and monkeys and requires some additional factors producing necrosis of the mucosa to furnish conditions suitable for its growth.

Wound Healing and Ascorbic Acid.—Lund and Crandon studied the effect that preoperative diets and plasma vitamin C levels had on the postoperative healing of abdominal wounds. Postoperative hernias or disruptions are the result of poor healing. Of 58 patients who returned to the follow-up clinic from three months to one year after discharge 9 had hernia. Those with low preoperative plasma levels showed a larger percentage of hernia than did those with high levels. The same was true of patients with small amounts of the vitamin in their preoperative diets. However, low plasma values do not always mean depleted reserves, but the wounds of all patients with higher values should heal in so far as ascorbic acid is a factor in their healing. The disrupted wounds of 12 patients have been studied. Despite the low vitamin levels of 8 patients scurvy played no part in the disruption. The vitamin C reserves of 3 of the 4 remaining patients were severely depleted, and scurvy probably delayed or prevented the healing of their wounds. The main cause of the accident in the last patient was undoubtedly sepsis and not scurvy. The data suggest that a larger part of the problem of disruption will be solved by an improved suturing technic than will be solved by studies of or treatment with vitamin C. However, the fact that in a few instances disruption occurs in conjunction with severely depleted vitamin C reserves indicates that these reserves should be studied preoperatively and that if they are low proper treatment should be instituted.

Archives of Ophthalmology, Chicago

26:543-726 (Oct.) 1941

- Bilateral Uveitis with Associated Detachment of Retina. A. Rados, Newark, N. J.—p. 543.
- Color Stereoscopic Phenomenon. A. Loewenstein and G. Donald, Glasgow, Scotland.—p. 553.
- Retina in Systemic Vascular Hypertension: Clinical Study of Caliber of Retinal Arterioles and Retinal Arterial Diastolic Blood Pressure. F. L. P. Koch, New York.—p. 565.
- *Allergic Dermatitis and Conjunctivitis from Paredrine Hydrobromide. J. Laval, New York.—p. 585.
- Acute Follicular Conjunctivitis Resembling Béal's Type: Report of Two Cases, with Short Review of Literature. N. K. Bidyádhār, Sonpur State, Sonpur Raj, India.—p. 587.
- Kayser-Fleischer Ring Associated with Hepatolenticular Degeneration: Report of Six Cases. S. Gartner, New York.—p. 595.
- Biochemistry of Lens: XIV. Pathogenesis of Electric Cataract. J. G. Bellows and H. Chinn, Chicago.—p. 606.
- Thiamine Hydrochloride in Treatment of Tryparsamide Amblyopia. P. J. Leinfelder and R. B. Stump, Iowa City.—p. 613.
- Monocular Myasthenia Gravis: Prostigmine Methylsulfate as Differential Diagnostic Agent. M. T. Moore, Philadelphia.—p. 619.
- Fusional Movements in Permanent Strabismus: Study of Role of Central and Peripheral Retinal Regions in Act of Binocular Vision in Squint. H. M. Burian, Hanover, N. H.—p. 626.
- Unilateral Microphthalmia with Congenital Anterior Synchiae and Syndactyly. M. L. Berliner, New York.—p. 653.
- Vertical Nystagmus Following Lesions of Cerebellar Vermis. E. A. Spiegel, Philadelphia, and N. P. Scala, Washington, D. C.—p. 661.
- Angioid Streaks. R. O. Scholz, Baltimore.—p. 677.

Dermatitis and Conjunctivitis from Paredrine Hydrobromide.—Laval reports a case of conjunctivitis and dermatitis venenata following the use of 3 per cent paredrine hydrobromide as a mydriatic. He has used the 1 and 3 per cent solution for more than a thousand patients with no other ill effects. His patient had previously used a 1 per cent solution for two and a half months and had had no adverse reaction.

Archives of Surgery, Chicago

43:541-734 (Oct.) 1941

- Osteogenic Sarcoma: Analysis of Eighty Cases. C. E. Badgley and M. Batts Jr., Ann Arbor, Mich.—p. 541.
- Reproduction of Ulcerative Colitis in Dogs. J. K. Poppe, New Haven, Conn.—p. 551.
- *Subdural Hygroma. D. G. da Costa and A. W. Adson, Rochester, Minn.—p. 559.
- Cessation of Respiratory Exchange. W. H. Cassels, Chicago.—p. 568.
- Bladder of Women After Operation. C. Lintgen, Philadelphia.—p. 573.
- Specific Therapeutic Shock—The Hugh Young Reaction. W. J. MacNeal, New York.—p. 579.
- Acute Intussusception. C. W. Mayo and R. Woodruff, Rochester, Minn.—p. 583.
- *Giant Intracanalicular Fibroadenoma of Breast. F. M. Owens Jr. and W. E. Adams, Chicago.—p. 588.
- Adenocarcinoma of Tongue Arising from Vestige of Median Anlage of Thyroid Gland: Report of Case. W. J. Cromartie and O. G. Nelson, Nashville, Tenn.—p. 599.
- Cremasteric Spasm. M. Muschat, Philadelphia.—p. 609.
- Stainless Steel and Vitallium in Internal Fixation of Bone: Comparison. J. A. Key, St. Louis.—p. 615.
- Traumatic Chylothorax. D. D. Smith and E. Woliver, Cincinnati.—p. 627.
- *Differentiation of Surgical Jaundice from Severe Damage of Liver (Subacute Yellow Atrophy) Clinically Simulating It. J. H. Olwin, Chicago.—p. 633.

Subdural Hygroma.—Da Costa and Adson report the case of a boy aged 9 years who had been thrown from his pony two days prior to admission to the Mayo Clinic. He regained consciousness in about an hour after he was found but continued drowsy and vomited. At a hospital it was determined that his left arm and leg were partially paralyzed. The mother stated that the paralysis was less severe when he regained consciousness. During the night of the first day in the hospital the boy could be aroused, although he was drowsy. The vomiting ceased. The following day the left arm and hand appeared to be weaker. The drowsiness had abated somewhat. He had hemiparesis of the entire left side, including the face. An exploratory operation through a temporal decompression was performed. On perforation of the dura, blood-tinged cerebrospinal fluid spurted out, and further opening revealed a large pool of blood-tinged fluid between the dura and the arachnoid compressing the temporal, parietal and frontal lobes on the right side. The rent in the arachnoid was in the region of the sylvian fissure and from it more cerebrospinal fluid could be seen escaping. Approximately 4 ounces (120 cc.) of cerebrospinal fluid was removed when pulsations in the cerebral artery could be seen. To remove

any subsequent collection of fluid while the ventricles refilled and the brain was being replaced, a Penrose wick was inserted into the wound and left in place for four days. During this time fluid intake was encouraged. Convalescence was uneventful. On the eighth postoperative day normal function had returned to the foot and the arm. Full function of the face and the hand returned by the ninth postoperative day. He was dismissed on the fifteenth day with full function, except a slight incoordination of his fingers and a slight limp on walking alone. A subsequent report indicated that the boy had recovered completely.

Fibroadenoma of Breast.—Owens and Adams discuss the gross and microscopic features of "cystosarcoma phyllodes." They report a case of their own and summarize the 12 cases reported since 1931, when Lee and Pack collected 105 from the literature and added 4 personal cases. A list of the various names applied to the tumor is given, and the authors believe that the simple descriptive term "giant intracanalicular fibroadenoma of the breast" should be accepted.

Surgical Jaundice and Yellow Atrophy.—Olwin determined the prothrombin level in 62 patients with jaundice and found that in patients with obstruction of the common duct it varies widely, depending on the duration of the jaundice and on general nutrition and diet. In nearly all these patients, except those who had jaundice in the later stages, the prothrombin level after vitamin therapy was near normal in one to four days. However, only a small percentage of patients with hepatic cirrhosis, if hepatic damage is not too severe or has not been present too long, will show some response to vitamin K therapy even after intensive and prolonged vitamin and bile salts therapy. The results indicate that rather than the original prothrombin level the response of the liver to vitamin K as reflected in the prothrombin rise is the important point in the measurement of hepatic function. To eliminate absorption of vitamin K from the gastrointestinal tract the vitamin is given intravenously. If the original prothrombin determination is low 2 mg. of menadione is given intravenously and the prothrombin level is rechecked after twenty hours. If it is still below 100 per cent, a second dose is given and the level again determined in twenty-four hours. Most patients with good hepatic function will show a normal or nearly normal level at this time. Patients who fail to respond normally are then given vitamin K preparations orally, with occasional supplementary intravenous doses. Three patients with severe jaundice failed to show the usual response, and the similarity of their prothrombin studies combined with the severe hepatic damage in the 2 studied post mortem suggests that silent jaundice definitely influences the procedure. Patients who do not show a fairly prompt prothrombin response to vitamin K therapy should not be subjected to operation until the proper response occurs. Some patients will never show this response and will die, but they will have been spared the expense and distress of a major surgical procedure. Others, who otherwise may have died, may recover under medical management.

Connecticut State Medical Journal, Hartford

5:633-716 (Sept.) 1941

- Maternal Mortality in Connecticut: Analysis of Maternal Deaths During 1939. J. H. Howard, Bridgeport.—p. 646.
Some Remarks on "Cases and Observations by Medical Society of New Haven County." G. Blumer, New Haven.—p. 652.
Iontophoresis with Zinc Peroxide in Treatment of Indolent Ulcers: Preliminary Report. A. D. Gurewitsch, New York.—p. 664.
Diagnosis by Gastroscopy. S. D. Kushlan, New Haven.—p. 665.
Necessity for Rectosigmoidal Examination. S. B. Kleiner, New Haven.—p. 667.
Congenital Urologic Anomalies. C. H. Nueswanger, Waterbury.—p. 671.
Acute Aleukemic Leukemia. J. E. Crane, Stamford.—p. 673.
Tularemia in Connecticut. E. H. Gibbons, Newington; E. L. Lamoureux, Hartford, and H. A. Arkless, Newington.—p. 679.
Psychiatric Contraindications to Marriage. E. Kahn, New Haven.—p. 684.
Unusual Case of Hodgkin's Disease. W. Finkelstein, Waterbury.—p. 687.
New Yale Medical Library. H. Thomas, New Haven.—p. 689.

Indiana State Medical Assn. Journal, Indianapolis

34:447-540 (Sept.) 1941

- Tracheobronchial Obstruction and Its Relation to Pulmonary Tuberculosis. P. H. Becker and G. W. Holmes, Crown Point.—p. 447.
Thoracoplasty: Types of Tuberculosis Suitable for Operation: Report of Twenty-Five Cases. J. W. Strayer and G. A. Thomas, Lafayette.—p. 451.
Electrical Convulsion Therapy in Mental Disorders. G. E. Metcalfe, South Bend.—p. 455.
Blood Stain of Cornea. B. J. Larkin, Indianapolis.—p. 459.
Unexplained Fever. R. E. Mitchell, Indianapolis.—p. 461.
Cancer of Lung. R. B. Sanderson, South Bend.—p. 463.

Journal of Allergy, St. Louis

12:425-522 (July) 1941

- Stability of Reagin-Neutralizing Substance in Ragweed Pollen at Various Hydrogen Ion Concentrations. A. C. Batchelder and T. A. Gonder Jr., Baltimore.—p. 425.
Species Specificity of Alternaria in Asthma and Hay Fever. H. N. Pratt, Boston, with assistance of Carolyn L. Roorbach.—p. 431.
Studies in Absorption of Undigested Protein: X. Absorption from Gallbladder. M. Harten, I. Gray, S. Livingston and M. Walzer, Brooklyn.—p. 438.
Studies on Blood Histamine in Cases of Allergy: III. Effect of Administration of Histaminase on Symptoms and Histamine Content of Blood in Patients with Allergy. B. Rose, Montreal, Canada.—p. 441.
Blood Histamine Level in Asthma and in Eosinophilia. T. G. Randolph and F. M. Rackemann, Boston.—p. 450.
Coseasonal Intracutaneous Treatment of Hay Fever. F. K. Hansel, St. Louis.—p. 457.
Skin Testing Methods: Multiple Single Sitting versus Serial Small Group Tests. O. Swineford Jr., University, Va.—p. 470.
Oral Immunization for Poison Ivy Dermatitis. L. Zisserman, Philadelphia.—p. 474.
Comparative Study of Incidence of Acute Infectious Diseases in Allergic and Nonallergic Persons. W. T. Vaughan and V. J. Derbes, Richmond, Va.—p. 477.
Flour Allergy and Epithelial Hypersensitiveness to Ammonium Persulfate in Bakers and Millers. H. A. E. von Dishoeck, Amsterdam, The Netherlands, and D. J. Roux.—p. 481.
Asthma from Insect Emanations: Report of Case Due to Moths. E. Urbach and P. M. Gottlieb, Philadelphia.—p. 485.

Journal of Aviation Medicine, St. Paul

12:181-272 (Sept.) 1941

- *Consideration of Effects of Oxygen Lack of Cardiovascular System from Viewpoint of Aviation, with Analysis of Deaths Occurring Aloft on Commercial Aircraft. A. Graybiel, Boston.—p. 183.
Use of Tilt Table Test in Aviation Medicine. A. Graybiel and R. A. McFarland, Boston.—p. 194.
Medical Aspects of Air Raid Casualties and Air Raid Precautions and Treatment. C. L. Maxwell, Mitchell Field, N. Y.—p. 212.
Differences in Judgment of Depth Perception Between Stationary and Moving Objects. R. Y. Walker, Columbus, Ohio.—p. 218.
Intelligence Testing of Flying Cadet Applicants: Report on Psychometric Measurement. W. A. Carlson, Randolph Field, Texas.—p. 226.
The Small District Examiner's Neuropsychic Problem. G. S. Backenstoe, Emmaus, Pa.—p. 230.
What Constitutes Neurocirculatory Asthenia? Description of Two Types. S. L. Immerman, Philadelphia.—p. 236.
New Precision Pipet for Volumetric Gaseous Analysis. E. Simonson, Milwaukee.—p. 240.

Effects of Oxygen Lack on Cardiovascular System.—Graybiel states that the symptoms and associated changes in circulatory dynamics which may appear in the person with a normal heart under conditions of civil or military aviation are not indicative of heart failure but merely adjustments or compensatory reactions to oxygen deficiency. The normal heart is not damaged, but anoxemia can precipitate heart failure in patients with heart disease. Pain of cardiac origin and specific symptoms of heart failure (dyspnea, weakness and collapse) have been encountered occasionally. Congestion of the lungs has been observed occasionally and arrhythmias rarely. The experience of a number of investigators with patients with coronary disease and angina pectoris shows that exposure to low oxygen tensions does not produce pain in patients who do not suffer from angina pectoris, even though coronary disease and healed myocardial infarction are present. The author's experience with 4 patients with severe coronary disease and angina pectoris subjected to a simulated altitude of 14,500 feet for forty-five minutes confirms this view. To determine the incidence of serious cardiac illness or death among passengers the author analyzed the information from five major commercial airlines, which have carried more than seven million passengers; approximately one and one quarter million passengers were carried by planes which rarely flew higher than 10,000 feet,

and the remaining passengers were carried by planes which at times flew between 10,000 and 15,000 feet and occasionally even higher. Only 3 deaths, ascribed to heart failure, occurred aloft. Death occurred in 5 passengers shortly after deplaning, in 2 of them from heart failure. Deaths of passengers taking place shortly after deplaning must be few, because otherwise the airline insurance departments would be involved. There is a record of 4 passengers in whom angina pectoris developed and was controlled with oxygen and amyl nitrite and of 1 suffering from coronary occlusion at an altitude of 18,000 feet who recovered without additional oxygen. According to Colonel Tuttle, of the United Air Lines, during three years oxygen was given to 1,415 of 1,084,190 passengers on the advice of their physicians or because of "evidence of anoxemia" at some time during the flight. Persons with well compensated heart disease need not hesitate to fly at the highest altitudes now flown in commercial aviation, provided additional oxygen is used, but persons with severe valvular disease, easily provoked angina pectoris or recent congestive failure and the old and feeble should be advised against traveling by air.

Journal of Experimental Medicine, New York

74:1-104 (July) 1941

- Histologic Changes Following Ovariectomy in Mice: I. Dba High Tumor Strain. Elizabeth Fekete, G. Wolley and C. C. Little, Bar Harbor, Maine.—p. 1.
- Inquiry into Structural Conditions Affecting Fluid Transport in Interstitial Tissue of Skin. P. D. McMaster, New York.—p. 9.
- Method to Determine Peripheral Arterial Blood Pressure in Mouse. P. D. McMaster, New York.—p. 29.
- Swine Lungworm as Reservoir and Intermediate Host for Swine Influenza Virus. I. Presence of Swine Influenza Virus in Healthy and Susceptible Pigs. R. E. Shope, Princeton, N. J.—p. 41.
- Id.: Transmission of Swine Influenza Virus by Swine Lungworm. R. E. Shope, Princeton, N. J.—p. 49.
- Constituents of Elementary Bodies of Vaccinia: IV. Demonstration of Copper in Purified Virus. C. L. Hoagland, S. M. Ward, J. E. Smadel and T. M. Rivers, New York.—p. 69.
- Effect of Virus. Host Cell Relationship on Infection with Vaccinia. D. H. Sprunt, Durham, N. C.—p. 81.
- Cardiac Factor in "Pressor" Effects of Renin and Angiotonin. W. H. P. Hill and E. C. Andrus, Baltimore.—p. 91.

74:105-166 (Aug.) 1941

- Chemical Studies on Bacterial Agglutination: VI. Agglutinin Content of Antiserums to Hemolytic Streptococci. S. D. Henriksen and M. Heidelberger, New York.—p. 105.
- Influence of Age on Susceptibility and on Immune Response of Mice to Eastern Equine Encephalomyelitis Virus. Isabel M. Morgan, New York.—p. 115.
- Constituents of Elementary Bodies of Vaccinia: V. Flavin Associated with Purified Virus. C. L. Hoagland, S. M. Ward, J. E. Smadel and T. M. Rivers, New York.—p. 133.
- Second Attacks of Polomyelitis: Experimental Study. H. A. Howe and D. Bodian, Baltimore.—p. 145.

74:167-296 (Sept.) 1941

- Capacity of Renal Vascular Bed in Hypertension. A. J. Cox Jr. and W. Dock, San Francisco.—p. 167.
- Capacity of Coronary Bed in Cardiac Hypertrophy. W. Dock, San Francisco.—p. 177.
- Myohemoglobinuria: Study of Renal Clearance of Myohemoglobin in Dogs. C. L. Yuile and W. F. Clark, Rochester, N. Y.—p. 187.
- Tubular Factor in Renal Hemoglobin Excretion. C. L. Yuile, J. F. Steinman, P. F. Hahn and W. F. Clark, Rochester, N. Y.—p. 197.
- Behavior of Pox Viruses in Respiratory Tract: IV. Nasal Instillation of Fowl Pox Virus in Chickens and in Mice. J. B. Nelson, Princeton, N. J.—p. 203.
- Observations on Infection of Chick Embryos with Bacterium Tularensis, Brucella and Pasteurella Pestis. G. J. Buddingh and F. C. Womack Jr., Nashville, Tenn.—p. 213.
- Roentgen Radiation of Papilloma Virus (Shope): II. Effect of X-Rays on Papilloma Virus in Vitro. J. T. Sylverton, G. P. Berry and S. L. Warren, Rochester, N. Y.—p. 223.
- Renal Hypertension Produced by Amino Acid. R. J. Bing and Marjorie B. Zucker, New York.—p. 235.
- Immunologic Specificity of Material Sedimentable at High Speed Present in Normal and Tumor Tissues. J. Furth and E. A. Kabat, with assistance of J. Brundage and Mary C. Boon, New York.—p. 247.
- Neutralization of Agent Causing Leukosis and Sarcoma of Fowls by Rabbit Antiserum. E. A. Kabat and J. Furth, New York.—p. 257.
- Further Studies of Infectious Unit of Vaccinia. R. F. Parker, L. H. Bronson and R. H. Green, Cleveland.—p. 263.
- Endocrine Function of Surgically Reduced Pancreas. B. A. Houssay, V. G. Foglia and F. S. Smyth, Buenos Aires, Argentina, South America.—p. 283.

Journal of Infectious Diseases, Chicago

69:1-96 (July-Aug.) 1941

- Effect of Pectin, Galacturonic Acid and Alpha Methyl Galacturonate on Growth of Enterobacteriaceae. J. E. Steinhaus and C. E. George, Lincoln, Neb.—p. 1.
- Oral Lesions Associated with Dietary Deficiencies in Monkeys. O. D. Chapman and A. E. Harris, Syracuse, N. Y.—p. 7.
- Animal Inoculations with Pure Cultures of Trichomonas Vaginalis and Trichomonas Foetus. R. E. Trussell, Iowa City, and S. H. McNutt, Ames, Iowa.—p. 18.
- Sylvatic Plague Studies: I. Convenient Individual Mouse Jar. J. R. Douglas and C. M. Wheeler, San Francisco.—p. 29.
- Study of *Asterococcus Muriis* (*Streptobacillus Moniliformis*) I. Morphologic Aspects and Nomenclature. F. R. Heilman, Rochester, Minn.—p. 32.
- Id.: II. Cultivation and Biochemical Activities. F. R. Heilman, Rochester, Minn.—p. 45.
- Study of *Actinobacillus Ligneresi* from Sheep Affected with Actinobacillosis. E. A. Tunnichiff, Bozeman, Mont.—p. 52.
- Frequency of Occurrence of *Salmonella* Species. S. Bornstein, I. Saphra and L. Strauss, New York.—p. 59.
- Studies on Measles. III. Use of Tissue Culture in Propagation of Measles Virus. G. Rake, M. F. Shaffer and Helen P. Jones, New Brunswick, N. J.—p. 65.
- Studies on Inactivation of Diphtheria Toxin by Vitamin C (Ascorbic Acid). C. W. Jungblut, New York.—p. 70.
- Synthetic Medium for Cultivation of *Streptococcus Fecalis*. Roslyn L. Schuman and M. A. Farrell, State College, Pa.—p. 81.
- Respiration of Malaria Plasmodia. J. Maier and L. T. Coggeshall, New York.—p. 87.

Journal-Lancet, Minneapolis

61:303-344 (Aug.) 1941

- Some Diseases of Lower Part of Genital Tract. M. C. Piper, Rochester, Minn.—p. 333.
- Space Thinking and Time Thinking. J. Sundwall, Ann Arbor, Mich.—p. 337.

61:345-392 (Sept.) 1941

- Late Effects of Toxemias of Pregnancy. J. H. Moore, Grand Forks, N. D.—p. 368.
- Fractures of Fingers. E. D. Lamb, Klamath Falls, Ore.—p. 372.
- History and Development of Student Health Programs in Colleges and Universities. J. E. Raycroft, Princeton, N. J.—p. 375.

Journal of Urology, Baltimore

46:355-566 (Sept) 1941. Partial Index

- Tuberculoma of Kidney. Report of Case. H. G. Bugbee, New York.—p. 355.
- Role of Liver and Thyroid as Metabolic Factors in Production of Renal Calculi. W. J. Erickson and L. M. Morrison, Philadelphia.—p. 359.
- Localized Obstructing Pyelonephritis. J. A. Hyams and H. R. Kenyon, New York.—p. 380.
- *Endometrioma of Ureter. A. Randall, Philadelphia.—p. 419.
- Sulfathiazole and Sulfadiazine in Treatment of Gonococcal Infections of Chorioallantoic Membrane of Chick. F. B. Bang and Betsy G. Bang, Nashville, Tenn.—p. 427.
- Magnesium Sulfate Intravenously in Preoperative Treatment of Uremia or Decreased Kidney Function. J. C. Negley, Glendale, Calif.—p. 431.
- Coronary Insufficiency and Operative Risk. I. Wills, Santa Barbara, Calif.—p. 475.
- Ureteral Strictures in Relation to Hypertension. J. W. Pennington, Phoenix, Ariz.—p. 491.
- Care of Bladder at Front When Paralyzed by Injuries to Spinal Cord. F. Hinman, San Francisco.—p. 499.
- Contracted Bladder Neck, Frequent Result of Youth Delinquency. J. R. Dillon, San Francisco.—p. 510.
- Roentgen Demonstration of Prevesical Spaces. B. Strauss, San Francisco.—p. 520.
- Extraperitoneal Rupture of Bladder in Transurethral Prostatectomy. M. L. Polse, San Francisco.—p. 528.
- Gonococcal Pyelonephritis: Complication of Renal Tuberculosis. J. A. May, San Diego, Calif.—p. 535.
- Perirenal Abscess with Gas Formation and Metastatic Pulmonary Abscesses Due to Friedlander's Bacillus: Case Report. L. Kindall, Oakland, Calif.—p. 555.
- Use of Powdered Sulfanilamide in Infected Genitourinary Wounds. C. D. Donahue, Eugene, Ore.—p. 562.

Endometrioma of Ureter.—Randall states that a careful review of the literature failed to reveal a case of intraureteral endometrioma. He thinks that heretofore such growths have masqueraded as primary ureteral neoplasms. He reports such a case in the hope that such an eventuality will be thought of and that when it is recognized radical surgical intervention will be avoided. He points out that the cyclic occurrence of intensified symptoms, especially hematuria, in a woman in her fourth decade should always arouse suspicion. Such patients should always be examined for the possible presence of pelvic endometriosis.

Kentucky Medical Journal, Bowling Green

39:265-308 (Aug.) 1941

- Clinical Consideration of the Climacterium. L. W. Zimmerman, Louisville.—p. 270.
Virgil Pendleton Gibney. D. C. Patterson, Bridgeport, Conn.—p. 276.
Prostatism. W. V. Pierce, Covington.—p. 279.
Spontaneous Pneumothorax. R. J. Griffin, Lexington.—p. 284.
Influence on Public Health Progress of Inadequate Medical Services in Rural Population. C. B. Crittenden, Louisville.—p. 289.
Problems in Hematologic Diagnosis. L. Hamman, Baltimore.—p. 295.

39:309-368 (Sept.) 1941

- A. M. A. Meeting at Cleveland, June 2-6, 1941. M. Casper, Louisville.—p. 354.
Results of Sobisminol Mass Administered Orally. J. R. Pate, Louisville.—p. 360.

Laryngoscope, St. Louis

51:607-738 (July) 1941

- Vitamins and Eye, Ear, Nose and Throat. I. H. Jones, Los Angeles.—p. 609.
Vitamins and the Ear. W. P. Covell, Los Angeles.—p. 683.
American Otologic Society: Presidential Address. G. M. Coates, Philadelphia.—p. 692.
Use of Temporary Inexpensive Bite Block to Determine Relationship of Closed Bite and Temporomandibular Joint Symptoms. F. Woodward, Charlottesville, Va.—p. 698.
Von Recklinghausen's Disease in Otolaryngology. C. H. Smith, New York.—p. 705.
Otosclerosis with Unusual Pathologic Findings. M. F. Jones, New York.—p. 714.
Atypical Facial Neuralgia. G. H. Hyslop, New York.—p. 719.

18:739-820 (Aug.) 1941

- Rhinology in Children, Résumé of and Comments on Literature for 1940. D. E. S. Wishart, Toronto, Canada.—p. 739.
Chemotherapy of Tuberculous Otitis Media. F. R. Spencer, R. W. Whitehead, W. C. Black and G. J. Duffner, Denver.—p. 773.
Influence of Nasopharyngeal Hyperplasia on Ear: Histologic Examination of Hyperplastic Lymph Follicles After Irradiation. H. P. Schenck, Philadelphia.—p. 780.
Surgery of Auricle, Including Total Reconstruction and Protuberant Ears. G. H. Cox, New York.—p. 791.
Experimental Observations on Question of Auditory Fatigue. H. G. Kobrak, J. R. Lindsay and H. B. Perlman, Chicago.—p. 798.
Suppurative Alveolitis and Its Effect on Maxillary Sinus. S. Rabkin, Cincinnati.—p. 811.

Medical Annals of District of Columbia, Washington

10:319-370 (Sept.) 1941

- Mental Hygiene and Psychiatry. P. J. Ewerhardt, Washington.—p. 319.
Venereal Disease Control Through Public Health Facilities. W. K. Angevine, Washington.—p. 323.
Normal Electroretinogram. J. R. Cavanagh and H. B. Gwynn, Washington.—p. 326.
Acute Hematogenous Osteomyelitis. G. W. Leadbetter, Washington.—p. 331.
Cleidocranial Dysostosis: Report of Case. L. F. Cooper, Washington.—p. 334.

New England Journal of Medicine, Boston

225:351-390 (Sept. 4) 1941

- Tufts Postgraduate Medical Program. S. Proger, Boston.—p. 351.
Chlorosis. I. Olef, Boston.—p. 358.
Imperforate Hymen with Hematocolpos. S. O. Hoerr, Boston.—p. 365.
Significance of History of Asthma with Reference to Serotherapy. D. D. Rutstein, E. S. Rogers and Isabel McCaffrey, Albany, N. Y.—p. 368.
War Medicine, with Special Emphasis on Use of Blood Substitutes. C. A. Janeway, Boston.—p. 371.

Chlorosis.—Olef believes that one of the factors responsible for the apparent rarity of chlorosis is the allocation of many mild and some severe cases into the categories of nutritional or microcytic anemia with achlorhydria. Chlorosis is probably not as rare as is implied. During the last four years he has encountered 8 such patients who presented no clinical or laboratory evidence of acute, recurrent or chronic infections, severe visceral disease or abnormal blood loss. The anemia in chlorosis is of the hypochromic microcytic type; and, since histamine anacidity or hypoacidity is a common observation, it is probably a deficiency disease conditioned by a gastrointestinal disorder. In chlorosis, the erythrocytes are hypochromic, small and flattened. Quantitatively the thrombocytes are normal or increased. In other types of anemia the platelets are reduced and rise with improvement of the anemia, but in chlorosis there is an inverse relation between the platelet level (when elevated above normal) and the hemoglobin value. When thrombocytosis is at

all present, it is well defined. Iron therapy cures the disease. The author suggests that the term "chlorosis" be discarded and that the disease should be more appropriately called "hypochromic iron-deficiency anemia of adolescence, frequently associated with achlorhydria."

225:393-432 (Sept. 11) 1941

- Mosaic of Androgyny: Maleness Within the Female and Femaleness Within the Male. G. Draper, New York.—p. 393.
Pneumonia in Massachusetts, 1900-1940. D. O'Hara, Boston.—p. 402.
Frequency of Poliomyelitis in Pregnancy. W. L. Aycock, Boston.—p. 405.
Diabetes Mellitus. E. P. Joslin, H. F. Root and C. C. Bailey, Boston.—p. 416.

Poliomyelitis in Pregnancy.—Aycock points out that seasonal, climatic, familial and constitutional selectivities in the distribution of paralytic poliomyelitis among those exposed to the virus suggest differences in the persons exposed rather than to differences in exposure. Bulbar poliomyelitis following tonsillectomy and adenoidectomy suggests the mucosa of the upper part of the respiratory tract as the susceptible port of entry. The author cites 56 cases of poliomyelitis associated with pregnancy; 28 are from the literature and 28 from personal records. When the disease occurred during the pregnancy of 2 is not known, in 9 it occurred in the first, in 19 in the second and in 23 in the third trimester. Three cases occurred after delivery. Thus the latter months of pregnancy predominate, although the data for the first months may be discrepant. Collection data preclude statistical analysis, but it is estimated that the chance coincidence of the two conditions is roughly 1:1,000 cases of poliomyelitis and 1:50,000 pregnancies. In the Detroit outbreak in 1939, the estimated expectancy of coincidence of poliomyelitis in pregnancy was less than 1 case; 4 cases were observed. The suspected association with pregnancy, in view of accompanying alterations in mucous membrane due to estrogenic changes, suggests that autarcologic susceptibility to poliomyelitis may reside in the economy of estrogenic substance. To establish the frequency of poliomyelitis in pregnancy similar studies must be made in other outbreaks.

Radiology, Syracuse, N. Y.

37:261-390 (Sept.) 1941

- Cholangiography, Fractional Method. W. S. Altman, Boston.—p. 261.
Gastrocolic Fistula: Report of Twelve Cases. M. Ritvo and E. J. McDonald, Boston.—p. 269.
Study of Gastrointestinal Tract of Children and Its Relation to the Adult. W. W. Wasson, Denver.—p. 277.
Roentgenologic Consideration of Normal Mucosa of Duodenum. M. Feldman, Baltimore.—p. 284.
Clinical Significance of Roentgenologic Findings of Small Intestine. S. A. Portis, Chicago.—p. 289.
Roentgen Findings in Alkaptonuria Ochronosis. M. M. Pomeranz, L. J. Friedman and I. S. Tunick, New York.—p. 295.
Roentgen Therapy in Tuberculous Cervical Lymphadenitis. H. Hauser, Cleveland.—p. 304.
Effect of X-Ray Therapy for Closure of Epiphyses: Preliminary Report. D. Spangler, Dallas, Texas.—p. 310.
Roentgen Irradiation of Calcareous Deposits About Shoulder. L. W. Baird, Temple, Texas.—p. 316.
Treatment of Peritendinitis Calcarea in Shoulder Joint. I. Klein and I. S. Klems, New York.—p. 325.
Milliameters at Ground Potential in X-Ray Tube Circuits. L. D. Marinelli, New York.—p. 331.
Note on Distribution of Surface Radiation from Million Volt Generator. M. C. Reinhard and H. L. Goltz, Buffalo.—p. 335.
Some Recent Contributions of Physics and Engineering Research to Radiology. B. Cassen, East Pittsburgh, Pa.—p. 338.
Misplaced Spinal Lipiodol: Analysis of 104 Lipiodol Spinograms. W. B. Hamby, Buffalo.—p. 343.
Pathologic Dislocations at Atlantoaxial Joint: Unusual Complication of Rheumatic Fever. W. A. Evans Jr., Detroit.—p. 347.
Roentgen Diagnosis of Intrauterine Hydrocephalus. R. Torpin and L. P. Holmes, Augusta, Ga.—p. 351.

Roentgen Therapy in Lymphadenitis.—Hauser treated 108 consecutive cases of tuberculous cervical lymphadenitis with roentgen irradiation. The following physical factors were used: The kilovolt potential was 200, with 0.75 mm. of copper and 2 mm. of aluminum filtration, a target-skin distance of 50 cm., a fractional dose of 150 r every ten days for a period of one hundred days, or a total dose of 1,500 r. If 20 milliamperes of current is used, the output amounts to 35 r per minute. When the lesions are bilateral, 100 r is applied to each side of the neck at the same sitting. The time-intensity factor precludes any possibility of cutaneous damage even if

the treatments were to be repeated. In only 1 of the author's patients did atrophy and telangiectasis develop after four courses of treatment during two and a half years. Regardless of the rate of response, a total of ten treatments was given. Of the 108 patients 14 were excluded because they received only one or at most two treatments. Of the 94 remaining patients 67 per cent received a course of ten exposures. A satisfactory follow-up observation lasting from a few months to seven years was had for 87; 7 have been lost track of. Of the 87 patients 77 (88.5 per cent) had satisfactory results and 10 (11.5 per cent) were considered unsuccessfully treated. Results were considered satisfactory when lesions regressed from 50 to 100 per cent either during the course of treatment or within a few months after the last exposure, when symptoms (pain, tenderness or draining sinuses) were relieved and when the deformity disappeared or was negligible. All other results were considered unsatisfactory.

Rhode Island Medical Journal, Providence

42:161-180 (Sept.) 1941

Carcinoma of Right Colon: Its Diagnosis and Principles of Treatment. L. S. McKittrick, Boston—p. 161
Present Status of Our Knowledge Concerning Sulfadiazine. W. J. Doyle, Providence—p. 166.

South Carolina Medical Assn. Journal, Florence

37:233-266 (Sept.) 1941

Thyroid Disease. F. H. Lahey, Boston—p. 233.
Low Back Pain and Sciatica Caused by Faulty Mechanics at Lumbosacral Area. G. R. Dawson, Charleston—p. 242.
Conjunctival Plastic Operation in Cases of Hypotonia from Filtering Operations or Ocular Fistulas. J. B. Workman Jr., Columbia—p. 249.

Southern Medical Journal, Birmingham, Ala.

34:899-1020 (Sept.) 1941. Partial Index

Accidents in Renal Surgery. N. F. Ockerblad and H. E. Carlson, Kansas City, Mo—p. 899
Deaths from Acute Appendicitis in Louisville. G. Aud, Louisville, Ky.—p. 914.
Medical Treatment of Hypertension. M. Flexner, Louisville, Ky.—p. 916.
Acute Atrophy of Liver Associated with Pregnancy: Report of Two Cases, One Terminating by Recovery. E. T. Ellison, Greenville, Miss.—p. 938.
Therapy of Lymphogranuloma Venereum. R. Brandt and R. B. Greenblatt, Augusta, Ga—p. 941.
Spontaneous Subarachnoid Hemorrhage. C. C. Turner, Memphis, Tenn.—p. 949.
Headaches. P. Mahoney and J. S. Agar, Little Rock, Ark—p. 956.
Sympathetic Ophthalmia: Some Remarks Concerning Its Etiology, Diagnosis and Treatment: Case Reports. W. D. Gill, San Antonio, Texas.—p. 959.
Syphilis Control Program in Mississippi. P. T. Erickson and D. V. Galloway, Jackson, Miss—p. 976
Hay Fever Plants of the South. R. P. Wodehouse, Yonkers, N. Y.—p. 986.
Statistics on Lobar Pneumonia. W. L. Cooke, Charleston, W. Va—p. 1000.
Use of Progesterone in Nervous Tension States. L. A. Gray, Louisville, Ky.—p. 1004.
Limitations of Estrogen Therapy. W. O. Johnson, Louisville, Ky.—p. 1006.

Tennessee State Medical Assn. Journal, Nashville

34:337-376 (Sept.) 1941

*Benzedrine Sulfate in Obesity. R. B. Chrisman Jr. and W. Maury Jr., Memphis—p. 337.
Report of Use of Pentothal Sodium as Intravenous Anesthetic. W. L. Poole, Johnson City, and C. H. Long, New Orleans—p. 340.
Study in Thyroid Heart Disease with Notes on Masked Hyperthyroidism. P. H. Livingston, Chattanooga—p. 344
Some Notes on Neurology of Children. W. de Gutierrez Mahoney, Nashville—p. 352.
Diabetes Mellitus—Low Index of Suspicion, Methods for Control. H. C. Long, Knoxville—p. 358.

Amphetamine Sulfate in Obesity.—Chrisman and Maury selected 27 obese patients for treatment with amphetamine sulfate; all but 1 were women, 21 of whom were being treated for various gynecologic disorders and the others for "uncomplicated" obesity. All had previously but unsuccessfully attempted weight reduction through diet. Thyroid had been given to 11; in 9 it had failed to cause weight loss, and 1 of the 2 in whom it was effective was sensitive to it. The original dose of amphetamine sulfate was 5 mg. a day, 25 mg. being

given fifteen to thirty minutes before breakfast and before lunch. The dose was increased by 2.5 mg. every fourth day, but it never exceeded 20 mg. Other medication was given when indicated, but only 1 patient was also given thyroid. Dietary restriction was not imposed. The weight loss during amphetamine therapy ranged from 0 to 30 pounds (13.6 Kg.), with an average of 14 pounds (6.3 Kg.). The average rate was 2 pounds (1 Kg.) per week. The greatest loss, as well as the greatest inhibition of appetite, usually occurred between the second and fifth weeks. Fat disappeared chiefly from the abdomen and hips. Most patients lost their desire to "nibble" or overeat. There were only two failures. These occurred in uncooperative patients who suffered from nausea attributed to the medication, but it persisted after the drug was withdrawn. Other than the curtailment of appetite, the effect most frequently reported was a sense of well-being and increased energy. In a few instances dysmenorrhea was relieved. The weight of most patients remained fairly stationary on a maintenance diet after medication was discontinued. Placebos were given to 5 patients at the conclusion of treatment with amphetamine sulfate; 4 gained from 1½ to 6 pounds (0.7 to 2.7 Kg.) in five weeks, and 1 lost ¾ pound (0.3 Kg.). The drug, chiefly by virtue of its central action, appears to be a valuable aid in weight reduction.

Virginia Medical Monthly, Richmond

68:563-620 (Oct.) 1941

*Spirochetal Jaundice in Virginia, with Special Reference to Laboratory Diagnostic Methods. J. D. Reid and Rebecca A. Holt, Richmond—p. 571.
Geriatrics and Its Role in Otolaryngology. J. A. Babbitt, Philadelphia—p. 576.
Haverhill Fever Following Rat Bite. A. D. Hart Jr., Charlottesville—p. 582.
Ovarian Pregnancy: Review of Literature and Case Report. R. B. Wilson, Philadelphia, and S. Robins, Richmond—p. 585.
Cervical Fibromyositis and Headache. B. L. Boynton, Norfolk—p. 587.
Choosing Method for Mass X-Raying of Service Men. N. Mercer, Philadelphia—p. 589.
Fungicidal Effect of Sulfur Compounds Tested by New Method. F. J. von Gutfeld and F. W. Shaw, Richmond—p. 592.
Use of Deproteinized Pancreas Extracts. M. J. Payne, Staunton—p. 594.
Acute Intussusception. E. L. Kendig Jr., Richmond—p. 596.
Place of Iodine in Treatment of Goiter: Analysis of 750 Cases. L. M. Bell, Winchester—p. 599.
Multiple Myeloma: Report of Case. J. Flax, Richmond—p. 605.

Spirochetal Jaundice in Virginia.—Reid and Holt report 4 cases of Weil's disease, bringing the total for Virginia up to 13. As the leptospira of the disease is more difficult to isolate and cultivate than most other pathogenic organisms, specialized laboratory procedures are essential for an accurate diagnosis. The authors emphasize the value of the leptospiral agglutination-lysis test. One of their patients was a bricklayer, 1 a pump operator and 2 picked chickens in a market. The living quarters of the 4 patients were such that rat-borne infections were possible but not probable.

War Medicine, Chicago

1:611-744 (Sept.) 1941

*Tuberculosis Among Selective Service Men in New York State. R. E. Plunkett, Albany, N. Y.—p. 611.
Training Medical Officers for War Duty: Work of United States Army's Medical Field Service School. E. E. Hume, Carlisle Barracks, Pa—p. 624.
Experiment in Hospital Mobility. L. W. Johnson, Washington, D. C.—p. 646.
Amputations, Stumps and Prostheses. E. H. Carnes, Memphis, Tenn—p. 656.
Electrocardiographic Record System for Clinical and Statistical Purposes. A. E. Parsonnet, Newark, N. J.—p. 664.
*Diphtheria. K. R. Nelson, Washington, D. C.—p. 671.
Schizoid Personality and Schizophrenia. L. H. Bartemeier, Detroit—p. 675.
*Connective Tissue and Phagocytes in Experimental Gas Gangrene Infection in Guinea Pigs: Effect of Sulfanilamide. B. Kropp and Dorothy G. Smith, Kingston, Ont—p. 682.
*Effect of Amphetamine (Benzedrine) on Fatigue of Central Nervous System. E. Simonson, N. Enzer and S. S. Blumstein, Milwaukee—p. 690.
*Electrocardiography in Military Medicine, with Special Reference to Its Lack of Value in Study of Recruits. F. C. Wood, C. C. Weirich and T. G. Miller, Philadelphia—p. 696.

Tuberculosis in New York State.—According to Plunkett, to avert the possibility of introducing tuberculosis into the Army and to avoid the financial burden on the community that such an introduction would create, the following routine is

carried out in three New York state induction stations: Immediately after registration and before the physical examination is begun the selectee is sent to the roentgen ray department, an exposure of his chest is made and the film is developed and interpreted as soon as ready. A report of the interpretation is then submitted, usually before the medical examination is completed, to the medical officer in charge. If it is advisable to make another exposure the selectee is returned to the roentgen ray department before the record of his physical examination is completed. Another exposure is rarely necessary when the 14 by 17 inch (35.5 by 43.1 cm.) paper or 14 by 17 inch celluloid film is used, and when the 4 by 5 inch (10.1 by 12.7 cm.) film was used it was necessary for less than 5 per cent of the selectees at the Buffalo induction station. The following criteria are used in classifying the roentgen data for acceptance or disqualification of the selectees: (1) Chest normal includes all thoracic roentgenograms with no evidence of tuberculous infection, (2) chest normal includes roentgenograms indicative of a residual childhood infection, (3) chest positive embraces all thoracic roentgenograms showing evidence of the reinfection type of pulmonary tuberculosis and primary tuberculosis and (4) thoracic pathologic conditions needing clinical appraisal. The total number of men examined roentgenographically at the induction stations of Buffalo, Syracuse and Albany from Nov. 25, 1940 to March 14, 1941 was 14,923, and 127, or 0.9 per cent, of them were disqualified for military service because of roentgen evidence of tuberculosis and 21 men were disqualified because of thoracic pathologic conditions other than tuberculosis. Experience with the different available mediums for thoracic roentgenograms has led to the conclusion that until some cheaper and equally accurate method is developed the 4 by 5 inch roentgen photographic film is the most economical and most practical film for screening large groups of persons. Admission to the Army of men with active or potentially active tuberculosis represents a serious hazard to public health.

Diphtheria.—Nelson points out that for diphtheria antitoxin to be highly effective it must combine with the available toxin rapidly, and it must combine in firm bondage. An antiserum that exercises both of these qualities was first called an avid antitoxin by Kraus and Baecher in 1913. O'Meara stated that in Dublin, Ireland, the gravis type of organism, causing a hypertoxic diphtheria, is extremely prevalent and can be isolated from about 85 per cent of patients admitted to the Cork Street Fever Hospital, among whom the fatality rate is high despite early administration of maximal doses of the antitoxin now generally used. Antitoxin treatment of this hypertoxic diphtheria, it is pointed out, can meet with success only when the antitoxin available neutralizes without delay the all important substance B in the local lesion, halting its toxic onslaught, and when union between toxin and antitoxin is so firm that no dissociation follows the dilution of the mixture in the circulation. Finally, the antitoxin must withstand the addition to it of quantities of toxin rich in substance B without forfeiting its avidity. However, antitoxins in general use today are of low avidity. As yet avid serum rich in anti B factor cannot be produced at will, though attempts are being made. Reports are awaited which will show whether the gravis types of *Corynebacterium diphtheriae*, prevalent in areas where hypertoxic diphtheria predominates, may be used for the preparation of toxoids and antitoxins better adapted to its more effective immunization and treatment. O'Meara believes that avid antitoxin contains a considerable amount of anti B and anti A antibody, and that therefore it is therapeutically efficient for hypertoxic diphtheria in which both substances A and B are active.

Gas Gangrene Infection.—Kropp and Smith studied the effect on the connective tissue and phagocytes of experimental gas gangrene in guinea pigs and also the effect of sulfanilamide on such infection. The animals were infected according to the method used and described by Reed and Orr. The toxin of *Clostridium welchi* rapidly attacked and destroyed subcutaneous connective tissue and the phagocytic cells present in the connective tissue. The organisms and toxin spread chiefly along connective tissue planes. The accumulation and phagocytic activity of leukocytes and other phagocytic cells at the wound were inhibited by the toxin of *Cl. welchi*. Sulfanilamide intro-

duced into the experimental gas gangrene wound partially overcame the inhibitory action of the infection on the migration of leukocytes and phagocytic cells of the connective tissue and the ability of histiocytes to phagocytose *Cl. welchi*.

Amphetamine and Fatigue.—Simonson and his co-workers determined the effect of amphetamine on fatigue of the central nervous system by measuring the fusion frequency of flicker. This method cannot be influenced by any voluntary effort. Sixty-two experiments were carried out with 6 subjects, twenty-four of them after the administration of 10 or 15 mg. of amphetamine. The fusion frequency was measured in the morning and late afternoon. The subjects performed their usual daily work (not manual). For the amphetamine experiments amphetamine sulfate was given before lunch. Some control experiments were performed with each subject with sodium bicarbonate. The fusion frequency of all subjects was definitely lower in all control experiments at the end of the working day. The decrease varied on different days, depending on the amount of work done and in general paralleling the subjective feeling of fatigue. In contrast to these data there was a slight increase of the fusion frequency in all experiments with amphetamine. None of the subjects felt tired on the days they had amphetamine. Thus the abolition of the sense of fatigue coincides with the increase of the excitability of at least the retinocortical system, as shown by the increase of the fusion frequency, and probably of the whole central nervous system. In 5 of the subjects 10 mg. of amphetamine sulfate produced no subjective effect other than abolition of fatigue. One subject felt fresh at the end of the working day but complained of drowsiness in the evening and sleeplessness in the night. It was not possible to repeat the experiment with a smaller dose. All absolute values of fusion frequency were higher in the afternoon on the days when amphetamine was used than they were on control days. The increase of fusion frequency after amphetamine had been taken did not depend on the absolute value of the fusion frequency in the morning. Therefore it seems that amphetamine increases the excitability of the central nervous system independently of its state of fatigue and excitability at the time when amphetamine is given.

Electrocardiography.—Wood and his colleagues discuss the probable value of electrocardiography in military medicine, based on the data of the electrocardiograms of 705 unselected students, 153 students with definite or suspected heart disease (whose age corresponds to that of army recruits) and 229 unselected corporation executives (whose age corresponds to that of army officers). The authors' conclusions are: In persons less than 30 electrocardiography does not demonstrate cardiac abnormalities of importance from the military standpoint which are not discoverable on physical examination. In young persons in whom heart disease is present or is suspected electrocardiography rarely adds further significant information. Finally, electrocardiography may confuse the issue by revealing minor abnormalities in persons who have no cardiac lesion of military significance. In persons more than 30 and especially in those more than 40 electrocardiography may occasionally demonstrate degenerative heart disease while the physical symptoms or signs are still not definite. In the latter age group study of a person with cardiac pain or with cardiac arrhythmia is incomplete without an electrocardiographic tracing. However, even in these older persons the electrocardiogram may confuse the issue more often than it clarifies it unless the examiner is aware of the frequent occurrence and relative insignificance of certain questionable electrocardiographic abnormalities and unless he has a clear conception of the characteristics of definitely abnormal electrocardiographic patterns.

West Virginia Medical Journal, Charleston

37:433-480 (Oct.) 1941

- Important Newer Concepts Concerning Cancer of the Intestines and Their Bearing on Management. J. A. Barga, Rochester, Minn.—p. 433.
Choice of Anesthetics. G. J. Thomas, Pittsburgh.—p. 442.
Testing Hearing and Evaluation of Results in Mathematical Figures. C. E. Kinney, Cleveland.—p. 448.
Surgical Objectives. M. J. Payne, Staunton, Va.—p. 453.
Differentiation of Genitourinary and Gastrointestinal Pathology. J. F. McCuskey, Clarksburg.—p. 457.
Medical Library of West Virginia University. G. S. Dodds, Morgantown.—p. 462.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:323-364 (Sept. 6) 1941

The Future of Medical Education as Seen by a Teacher. J. A. Ryle.—p. 323.

The Future of Medical Education: A Medical Student's View. D. McDonald.—p. 327.

Clinical Observations on Air Raid Casualties. R. T. Grant and E. B. Reeve.—p. 329.

Memorandum on Observations Required in Cases of Wound Shock. R. T. Grant.—p. 332.

2:365-392 (Sept. 13) 1941

Survey of 100 Cases of War Neuroses. J. D. Sutherland.—p. 365.

Fragarine: Inhibitor of Uterine Action (Preliminary Communication). B. Whitehouse.—p. 370.

Some Contributions to War Surgery from the Soviet Union. R. Clarke.—p. 372.

*Reduction of Hospital Infection of Wounds: Controlled Experiment. W. McKissock, Joyce Wright and A. A. Miles.—p. 375.

Reduction of Hospital Infection of Wounds.—According to McKissock and his collaborators, during a preliminary observation of four months the incidence of hospital infection with *Streptococcus pyogenes* among head wounds in a neuro-surgical unit was 10, or 31.3 per cent, in 32 air raid casualties, and 2, or 4.4 per cent, in 46 "clean" operative cases. After an improved dressing technic and a partially revised general ward procedure were instituted the incidence of hospital infection with *Str. pyogenes* was 1, or 2.2 per cent, in 46 air raid casualties and zero in 49 "clean" operative cases. The dressing technic was designed on the assumption that the main cause of hospital infection is the carriage of infected discharge from the wounds of 1 patient to the wounds of another patient by members of the medical and nursing staff. Air contamination and droplet infection was considered less important. With the addition of bins for dirty dressings with foot action lids the dressing team can be reduced to a minimum of three: The dresser who begins his work when the bandage and outer dressings have been removed from the wound and is assisted by the "dirty nurse." He applies the new bandage after which he washes his hands and forearms. The "clean nurse" looks after the trolley and its contents only, touching nothing throughout the entire dressing round. The "dirty nurse" removes the outer dressings and stands by until she assists in applying the final new bandage, after which she washes her hands and forearms. The bin porter takes care of two bins (one for washable soiled dressings and the other for dressings which must be destroyed). He washes his hands and forearms only at the beginning and the end of a round of dressings. All ward cleaning and bed-making were finished half an hour before dressings were started. No more than one dressing was uncovered at one time. No person having an infected lesion of the hand or a sneezing cold was permitted to dress wounds.

Lancet, London

2:301-330 (Sept. 13) 1941

Preparation of Alum Precipitated Toxoid for Use as Immunizing Agent. M. Barr, C. G. Pope, A. T. Glenny and F. V. Linggood.—p. 301.

*Liver Extract in Treatment of Tropical Macrocytic Anemia. H. C. Trowell.—p. 303.

Simple System of Splinting for Lower Limb. I. S. Smillie.—p. 304.

Pulmonary Moniliasis, with Primary Bronchogenic Pneumonia. J. K. McCollum.—p. 306.

Wasp Sting as Immediate Cause of Death. S. C. Dyke.—p. 307.

Pfeiffer Bacillus Meningitis: Recovery with Chemotherapy. J. T. Harold.—p. 308.

*Blood Amino Acids in Hematemesis. D. A. K. Black.—p. 309.

*Anginal Symptoms Arising from Hypothyroidism. H. Zondek.—p. 310.

Intestinal Damage from Small Wound. L. A. Ledingham.—p. 311.

Liver Extract for Tropical Macrocytic Anemia.—

Trowell found a crude liver extract (from British drug houses) to be satisfactory in the treatment of 2 patients with uncomplicated tropical macrocytic anemia. The weekly dose of this extract varied from 5 to 10 cc. The author believes that this less expensive crude liver extract may prove more effective in the treatment of macrocytic anemia than the refined liver extracts which are potent in the treatment of pernicious anemia. He suggests that some fractions essential to the cure of tropical macrocytic anemia may be lost in the refining process.

Blood Amino Acids in Hematemesis.—Black determined the amount of amino acid nitrogen in the blood of 7 patients with azotemia secondary to gastroduodenal hemorrhage. The data show an increase in amino acid nitrogen at the time of bleeding, the average being 15.2 mg. per hundred cubic centimeters. This increase is especially striking in view of the anemia which most of the patients had, since the amino acid content of plasma is only about a fifth of that of the erythrocytes, and low amino acid values might have been expected. The amino acid nitrogen level fell gradually as recovery took place. While a general correspondence existed between urea and amino acid values, the blood urea level was not necessarily highest at the same time as the amino acid nitrogen level. The increase in amino acid nitrogen probably indicates hepatic dysfunction, though this is slight compared with the renal impairment. This disparity may be due to the greater importance of circulatory factors in renal function.

Anginal Symptoms Arising from Hypothyroidism.—Zondek suggests that the possibility of hypothyroidism be kept in mind when patients with anginal symptoms are being treated. There are a number whose condition can be related to hypothyroidism. The main signs are a tendency to cardiac dilatation (mostly in the form of a pointed, sometimes rounded, dilatation of the left ventricle), bradycardia and low blood pressure. The electrocardiogram often shows flattening of the P and T waves, and the T wave is sometimes negative. The PR interval is sometimes prolonged. These patients complain of pain or substernal distress and compression or sometimes only of troublesome precordial tightness. They often find it difficult to describe clearly what they feel. The sensations are more or less continuous, whereas true anginal attacks are rare. As in true myxedema, an increase in blood cholesterol is an early symptom. The capillaries appear constricted and reduced in number, and the circulation in them is slow. Usually small doses of thyroid (0.5 to 0.7 Gm. weekly) are effective. Treatment should be continued for several weeks with short interruptions and repeated when bradycardia reappears. The cardiovascular syndrome described may be designated abortive myxedematous heart. Unlike the symptoms of ordinary vagal heart (primary vagotonia) its symptoms and signs are little, if at all, affected by drugs that decrease the vagal tonus or cause vasodilatation.

Medical Journal of Australia, Sydney

2:131-156 (Aug. 9) 1941

Fear as a Factor in Disease. H. H. Turnbull.—p. 131.

Social Aspects of Medicine. J. Dale.—p. 135.

Some Problems of Medical Sociology. R. Mailer.—p. 140.

2:157-188 (Aug. 16) 1941

Periodontal Disease and Its Medical Aspects. G. Christensen.—p. 157.

Disuse Atrophy of Skeletal Muscle. J. C. Eccles.—p. 160.

Comparison of Effects of Disuse and Denervation on Skeletal Muscle. G. Reid.—p. 165.

2:189-216 (Aug. 23) 1941

Studies in Atmospheric Pollen. Marie E. Phillips.—p. 189.

Nature of Eclampsia. W. J. Penfold.—p. 198.

Use of Sulfonamide Compounds in Filarial Complications. K. V. Earle.—p. 200.

2:217-248 (Aug. 30) 1941

Studies in Tuberculosis: III. Symptomless Tuberculous Bacilluria as Observed in Subjects with Osseous and Pulmonary Tuberculosis. R. Webster.—p. 217.

Value of Immunization in Pertussis. D. Vickery.—p. 221.

Note on Cultivation of *Hemophilus Pertussis*. Phyllis M. Anderson.—p. 224.

Some Observations on Effect of Sedative Drugs on "Cardiazol" Convulsion. N. V. Youngman.—p. 224.

Bull. of Health Org., League of Nations, Geneva

9:247-370 (No. 3) 1940-1941

League of Nations Antiepidemic Work in China in 1939.—p. 247.

Preventive Vaccination of Dogs Against Rabies: Critical Review. R. Gautier.—p. 269.

Nutritional Research in the Union of South Africa. E. H. Claver.—p. 327.

The Poor Rice-Eater's Diet. W. R. Aykroyd.—p. 342.

The Rice Problem. A. G. van Veen.—p. 357.

Annales Pædiatrici, Basel

157:65-128 (Aug.) 1941

- Posology in Pediatrics. H. Mautner.—p. 65.
*Coronary Calcification and Thrombosis in an Infant. S. van Creveld.—p. 84.
*Influenzal Meningitis. H. Nathhorst.—p. 93.
Skimmed Milk Acidified with Lactic or Citric Acid as Substitute for Buttermilk. H. Scheidegger.—p. 101.

Coronary Calcification and Thrombosis in Infant.—

Coronary thrombosis and calcification in young children raise the following questions. 1. Is there a relation between disease, intoxication or constitutional anomaly in the mother and the occurrence of arterial calcification and thrombosis in the infant? 2. Do these vascular changes help explain disturbances in respiration and circulation in cases of sudden death immediately or shortly after birth? Van Creveld discusses these questions in connection with the case of a girl aged 6 weeks who died during an attack of severe dyspnea five days after admission to the hospital. Necropsy disclosed coronary calcification and thrombosis. There was a peculiar swelling and necrosis of the capillary endothelium of the renal glomeruli. The child's mother had had bronchial asthma for some years, and during pregnancy she had made use of a prescription containing among other substances caffeine and lobeline. The hypothesis is advanced that the coronary lesions in the child were related to the allergic mother's use of drugs, giving rise to a localized hyperergic reaction.

Influenzal Meningitis.—Nathhorst reports data on 15 cases of influenzal meningitis observed at the children's hospital in Göteborg during the years from 1934 to 1940. During this period 118 cases of purulent meningitis were observed; cases of the influenzal (Pfeiffer's) form amounted to 11.8 per cent. The ages of the patients varied from 4 months to 10 years, but 11 were less than 2 years old. The author gives particular attention to the cases in which sulfanilamide or sulfapyridine was used. Specific serum therapy was not employed, although some patients were given serum (without complement) in small doses. Sulfapyridine was given in full doses to 6 children. The 2 oldest (aged 8 and 10 years) recovered. Of the children not treated with sulfapyridine only 1 was cured (aged 3½ years). With 1 exception, all the children who died were less than 2 years old. It seems that age is of greatest importance for the prognosis. Since the action of sulfapyridine is rather uncertain in influenzal meningitis, the author recommends that specific serotherapy be given in addition to it.

Schweizerische medizinische Wochenschrift, Basel

71:873-896 (July 26) 1941. Partial Index

- *Etiology and Therapy of Threatening and Recurrent Abortion. R. Wenner.—p. 873.
Relationship of Carbohydrate and Potassium Metabolism and Action of Adrenal Cortex on It. F. Verzar.—p. 878.
Experiments on Biologic Action of Pathologic Cerebrospinal Fluid of Human Subjects in Tests on Plants. E. Katzenstein-Sutro and Helen Staub.—p. 879.
Tuberculosis of the Heart: Tuberculous Phlebitis of Myocardium. P. Alphonse.—p. 882.
Wood Gas Poisoning. A. Wüst.—p. 883.
Investigations During 100 Kilometer Marches in Officer Schools. A. Jung.—p. 884.

Threatening and Recurrent Abortion.—Wenner presents observations on 133 cases of threatening and habitual abortion that were observed at the Basel clinic from 1930 to 1939. Until 1936 the treatment was purely conservative, that is, it was limited to bed rest and sedatives; after 1936, however, corpus luteum therapy was used. In a few cases vitamin E was given in addition to the corpus luteum. Comparison of the therapeutic results reveals that those of conservative treatment are inferior to those obtained with corpus luteum. In evaluating the efficacy of the corpus luteum therapy, it must be considered that at first the doses were rather small; thus some of the failure of this therapy must doubtless be ascribed to insufficient dosage. From results obtained in recent years with adequate doses of corpus luteum the author concludes that it should never be dispensed with in the treatment of threatening or recurrent abortion. In cases of the latter condition therapy should be begun early, that

is between the sixth and eighth week of pregnancy. Ten mg. of a corpus luteum preparation should be given every week by intramuscular injection, either 5 mg. given twice or 2 mg. given five times. If oral medication is preferred the dose must be from six to eight times as large. Because abortion is most likely at the time menstruation is due, bed rest is advised, and large doses are administered daily at these times. From the fifth to the seventh month of pregnancy the weekly dose is decreased to 2 mg. given twice a week by intramuscular injection. If abortion threatens in spite of this treatment, larger doses should be administered and the patients should remain in bed until the symptoms have subsided.

Arch. Argent. de Pediat., Buenos Aires

16:107-218 (Aug.) 1941. Partial Index

- *Results of Splenectomy in Erythroblastic Anemia: Two Cases. M. Acuña.—p. 126.

Splenectomy for Erythroblastic Anemia.—Acuña observed 2 patients with erythroblastic anemia who had splenectomy performed. The operation was done when the patients were aged 10 months and 5 years; they lived up to the ages of 9 and 15 years, respectively. The immediate results of splenectomy were good. The crisis of the blood and the general condition improved, the appetite and weight increased and the complexion, the color of the skin and the aspect of the mucosa also improved. The good results lasted for one or two years, after which erythroblastic anemia reappeared and progressed slowly but constantly. The physical development of the patients was deficient, and puberty was retarded. The patients grew, for the few years they lived, with progressive anemia, osteoporosis and a feeble constitution.

Medizinische Welt, Berlin

15:549-576 (May 31) 1941

- *Therapy of Epidemic Meningitis, Particularly with Sulfanilamide Derivatives: Report on 120 Cases. R. E. Mark.—p. 549.
Obstetric Injuries to Mother: Prevention and Therapy. E. Puppel.—p. 552.
*Autotransfusion, Particularly in Prophylaxis of Apoplexy. W. Kühn.—p. 557.
Myopia and Its Significance for Organ of Vision. H. Schulz.—p. 561.
Hippocratic Thought. P. Engelen.—p. 562.
Correct Application of Opium Law. W. Becker.—p. 563.

15:577-604 (June 7) 1941

- Estimation of Renal Function. W. Nonnenbruch.—p. 577.
*Therapy of Epidemic Meningitis, Particularly with Sulfanilamide Derivatives: Report on 120 Cases. R. E. Mark.—p. 580.
*Comotio and Contusio Cerebri: Present Conception of Their Nature, Their Differentiation, Clinical Aspects, Therapy and Possible Sequels. F. Jaeger.—p. 583.
High Incidence of Myocardial Lesions Among This Year's Influenza Cases. F. Klewitz.—p. 587.
Therapy of Late Exudative Eczematoid. F. Buckreis.—p. 588.
Accident and Tuberculosis. O. Boden.—p. 590.

Treatment of Epidemic Meningitis.—Mark reports observations on 117 patients with epidemic meningitis, of whom 48 were treated with acetylsulfanilamide, 39 with sulfapyridine and 30 only with serum and spinal puncture. The mortality was 8.4, 7.7 and 53.5 per cent respectively. The fact that of the group of 30 treated with serum and puncture but without a sulfanilamide preparation 16, or more than half, died demonstrates that sulfanilamide and its derivatives have greatly decreased the mortality of epidemic meningitis. Sulfapyridine was administered by mouth, whereas acetylsulfanilamide was given intravenously, intraspinally and by mouth. Acetylsulfanilamide in a dose of 5 cc. of a 30 per cent solution was given intraspinally at the time of the diagnostic puncture. In addition two or three intravenous injections of 5 cc. each were given daily for five or six days. The intraspinal administration may be repeated on the second day. After the intravenous treatment acetylsulfanilamide therapy is continued orally for four to seven days (two tablets three times daily). In this form acetylsulfanilamide proved more effective than did sulfapyridine. There was not a single death among 13 patients in whom early intraspinal administration of acetylsulfanilamide was employed. There were no harmful after-effects. Determination of the

comparative efficacy of acetylsulfanilamide and sulfapyridine would necessitate alternate application of the two preparations on a large number of patients. Either preparation should be employed in every case of epidemic meningitis.

Autotransfusion in Prophylaxis of Apoplexy.—Kühn directs attention to the treatment of cerebral hemorrhage that was recommended by Colella and Pizzillo in 1934. These authors took 25 or 30 cc. of blood from a brachial vein, mixed it with a small amount of sodium citrate solution and injected it into the gluteal muscle. Autotransfusion had a hemostatic effect and proved helpful in cerebral hemorrhages and their sequels irrespective of their cause or nature. Kühn resorted to autotransfusion for 250 patients, whom he classifies into four groups. The 81 patients of the first group had had an apoplectic attack and a threatened relapse because of increased intracranial pressure. Autotransfusion reduced the incidence of recurrence as well as of death. The author employed it in the presence of increased intracranial pressure either with or without hypertension. In a second group of 3 patients the apoplexy was in the early stage. Autotransfusion was followed by great improvement. The third group comprising 110 patients includes those in whom unilateral paresthesias, vertigo, temporary motor pareses, unilateral tremor, abnormal sensations of heat and cold and temporary aphasic and visual disturbances indicates considerable organic changes and the threat of apoplexy. In nearly all these patients improvement was noticeable after autotransfusion, and apoplexy was prevented. A fourth group of 56 patients had dull pain in the occiput or forehead, vertigo, loss of memory, a feeling of congestion in the head, vascular crises and tinnitus aurium. In this group also autotransfusion was followed by improvement.

Cerebral Concussion and Contusion.—Jaeger argues that differentiation between cerebral concussion, contusion and compression is difficult and that it is advisable to classify all cranio-cerebral injuries into those requiring conservative treatment and those necessitating surgical intervention. Conservative treatment should be employed in simple cerebral concussion, in cases complicated by edema of the brain and in contusion. Symptoms of concussion are most severe immediately after the trauma and subside in several hours or days without leaving anatomic changes. If headache, vertigo and vomiting persist after the unconsciousness has subsided or if a single nerve is paralyzed or hemiplegia exists, edema is to be suspected. This necessitates repeated spinal punctures and dehydration of the brain by means of intravenous injection of a 50 per cent solution of dextrose. Contusion is characterized by prolonged loss of consciousness, which may be so severe that incontinence of all the sphincters results and that all reflexes become abolished. As the unconsciousness subsides, there is usually disorientation and occasionally motor unrest, nausea and vomiting. Paralytic symptoms exist, the intracranial pressure is always increased and the cerebrospinal fluid contains blood. If the symptoms increase, danger threatens. It is essential to make careful neurologic and roentgenologic examinations and to keep pulse rate, blood pressure and respiration under constant control. Exploratory trepanation may be necessary in doubtful cases, if no improvement is observable after several days of conservative treatment. Exploratory trepanation is the only means of differentiating contusion from cerebral hemorrhage. Large accumulations of blood under the dura should be removed.

Klinicheskaya Meditsina, Moscow

19:1-176 (No. 2) 1941. Partial Index

- Classification of Clinical Types of Brucellosis. N. I. Ragoza.—p. 1.
Symptomatology and Course of Paratyphoid C. L. K. Korovitskiy, I. P. Drobinskiy and A. A. Shneerson.—p. 20.
Peritonitis of Bacillary Dysentery. S. I. Ratner.—p. 25.
Experimental Data on the Pathomorphology of Vaccine Encephalitis. M. S. Margulis.—p. 31.
*Sporadic Grip and Its Blood Picture. A. A. Korovin.—p. 69.

Blood Picture in Sporadic Grip.—Uncomplicated sporadic grip, according to Korovin, differs from the epidemic variety by a lesser contagiousness, the presence of chilling, the predominance of symptoms referable to the upper respiratory tract, the absence of severe prostration in the presence of a high

temperature, frequent herpetic eruption and a favorable course. In 53 per cent of the cases of sporadic grip there was leukopenia, in 35 per cent a normal leukocyte count and in 12 per cent leukocytosis. Neutropenia was present between the second and the fifth day of the illness in the cases of uncomplicated grip, with leukopenia or a normal leukocyte count. Lymphopenia was present during the first two to three days and eosinopenia during the entire febrile period. The number of monocytes was either normal or slightly diminished. In cases of sporadic grip leukopenia is not as frequent as in cases of epidemic grip. Toxic and degenerative alterations of the neutrophils are less common and less pronounced. The essential difference, however, in the blood pictures produced by the two forms is the absence of monocytosis or of histiocytosis in the sporadic form. The latter is characteristic of epidemic grip. In cases of complicated sporadic grip the majority of the patients had neutrophil leukocytosis. Epidemic and sporadic grip are distinct disease entities which may be differentiated clinically, epidemiologically and in part on the basis of the blood picture. Isolated cases of the epidemic variety of grip are to be seen during an epidemic-free interval. The patients probably act as reservoirs of the epidemic virus.

Nordisk Medicin, Stockholm

11:2261-2304 (Aug. 2) 1941

- Experiences with Salazopyrine. Nanna Svartz.—p. 2261.
Remarks on Treatment of Diabetes with Insulin and on Carbohydrate Tolerance. C. Sonne.—p. 2264.

Hospitalstidende

- *Tendovaginitis or Peritendinitis Crepitans of Upper Extremity Treated with Roentgen Irradiation in Combination with Immobilization. A. Bertelsen.—p. 2267.
Case of Diabetic Coma Overcome Exclusively by Application of Isotonic Sodium Bicarbonate Solution. E. Kirk.—p. 2279.

Hygiea

- Otosclerosis: Symptoms from Outer and Middle Ear. G. Holmgren.—p. 2281.
Morphologic Development of Bone Marrow in Fetus. N. G. Nordensson.—p. 2283.

Tendovaginitis Treated with Roentgen Irradiation and Immobilization.—Bertelsen states that freedom from symptoms resulted after an average of twenty-four days' treatment with combined roentgen radiation and immobilization in 83 cases of acute tendovaginitis or peritendinitis crepitans in which the treatment was begun from one to fourteen days after the onset of the disorder, in an average of thirty-two days in 19 cases of acute disease in which the treatment was started after two to six weeks, in an average of forty-two days in 15 cases of subacute disease in which treatment was given from one and a half to three months after the onset (1 case of subacute disease with particularly protracted course in which the treatment lasted eight months being excluded), in an average of forty-six days in 14 cases of subchronic disease in which admission took place after three to twelve months' duration of the disease and in an average of sixty days in 13 cases of chronic disease in which treatment was given after more than a year's duration of the disease, the time here varying greatly in the individual cases. The ability to work was restored after an average of five weeks in the cases of acute disease, after two to two and a half months in the cases of subacute and subchronic disease and as a rule after a still longer time in the cases of chronic disease. The author says that the frequency of recurrence and of chronic tendovaginitis or peritendinitis crepitans depends largely on the time of institution of the combined roentgen and immobilization treatment. Examination of 104 patients from one to ten years after treatment did not show recurrence, chronic tendovaginitis or peritendinitis in the 52 cases in which the treatment was begun during the first two weeks after the onset of the disease. The disorder became chronic in 1 of 15 patients with acute disease treated after two to six weeks, in 1 of 12 with subacute disease treated after one and a half to three months, in 5 of 15 treated after three to twelve months and in 4 of 13 treated after more than a year's time, and the conditions with regard to recurrence were similar.

Book Notices

Trauma and Disease. Edited by Leopold Brahdy, B.S., M.D., Physician in Charge of Occupational Diseases and Injuries in the Office of the Corporation Counsel of the City of New York, and Samuel Kahn, B.S., M.D., Medical Examiner in the Bureau of Workmen's Compensation of the Department of Labor, State of New York. Second edition. Cloth. Price, \$7.50. Pp. 653, with 13 illustrations. Philadelphia: Lea & Febiger, 1941.

This volume includes eighteen chapters devoted to the relation of trauma to specific disease conditions, written by authors prominent in their respective fields. The first chapter, by Drs. Brahdy and Kahn, the editors, serves as an introduction to the general subject and presents fundamental principles for determining the relationship between trauma and disease.

The articles are written from the point of view of the medical expert; as indicated in the opening chapters, an attempt has been made to avoid introducing a predominant medicolegal influence. Certainly this book is "must" reading for any one going to court as a medical expert, a witness, or a lawyer in a case involving trauma and disease. It should be of great value to those interested in industrial medical problems, compensation commissions and the many physicians, lawyers and jurists who are called on to decide in given cases what the effects of trauma may be. Particularly noteworthy are the chapters on trauma and heart disease, by Drs. Paul D. White and R. Earle Glendy, on trauma and neoplasms, by Dr. Leila Charlton Knox and on trauma and mental disorders, by Drs. Franklin G. Ebaugh and John D. Benjamin. The chapter on trauma and diabetes mellitus is, appropriately enough, bound upside down in the volume reviewed, beginning on page 545 and ending on page 560. The chapter presents the little that is known on the relationship of trauma to the etiology of diabetes and it is apparent that this is appallingly little. To make up for this the chapter is rounded out or padded with miscellaneous information on the disease that belongs more properly in a textbook on diabetes. For instance, sections are devoted to obesity, lack of exercise, the glycosuria deficiencies and diagnosis, errors in the interpretation and performance of blood sugar tests and diagnosis. Obviously, it could be argued that every important fact about diabetes is in some way related to trauma; but this is not a textbook of facts about diabetes.

Studies in Haemolytic Streptococcus Fibrinolysin, Antifibrinolysin and Antistreptolysin, with Particular Reference to Rheumatic Fever. By Sten Winblad. *Acta pathologica et microbiologica Scandinavica Supplementum XLIV.* Paper. Pp. 229, with 13 illustrations. Copenhagen: Ejnar Munksgaard, 1941.

This monograph contains a detailed and careful review of classification and antigenic properties of the streptococci, and numerous personal observations on fibrinolysin, antifibrinolysin and antistreptolysin. The work was carried out at the University of Lund, Sweden, from which other authors, connected with Dr. Winblad, have presented important contributions to the study of rheumatic fever. Therefore especial attention is directed to the significance of variations in titer of antifibrinolysin and antistreptolysin for the etiologic problem of rheumatic fever. In rheumatic fever the titer of both these antibodies rises to the level observed in other streptococcal diseases. The titer rises during the first weeks of the disease even if no accompanying or preceding streptococcal infection can be traced, and it slowly returns to normal, though it remains elevated longer than the sedimentation rate. In the interpretation of his data the author asks himself whether the occurrence of an elevated antibody titer against an organism justifies the opinion that the disease is due to that specific agent. The answer is obviously negative. He indicates that other evidence is necessary, such as "the direct isolation of the specific causative organism in the patient's blood, tissues, or excreta." The theory that rheumatic fever represents the allergic response of some individuals to streptococci might explain the difficulty encountered in the demonstration of the presence of this organism in the affected tissues. The author warns, however, that it must not be construed that the high antifibrinolysin and antistreptolysin titer implies the presence of an allergy to streptococci, because genuine allergy is shown only by the tissue reaction against the antigen, and not by the presence of humoral antibodies. Furthermore, the author observed that the rise of

antibody titer may occur either before or after the onset of the rheumatic attack. This last observation differs from the observations reported by some American authors and should be confirmed independently. The work presented here does not, and could not, arrive at a conclusion as to the probable etiology of rheumatic fever. It is the impression of the author that his findings agree with, but do not prove, the allergic streptococcus theory. The reviewer feels, however, that the same findings agree as well with the theory of a virus etiology in which the streptococcus plays the role of the most frequent, but not exclusive, activating or associated organism. The present monograph will be valuable to all those engaged in research in the etiology of rheumatic fever, because of the personal observations and because of the rich literature (three hundred and seventy references), including some not easily accessible important work by Scandinavian authors.

Das Schlichtbild der Lunge des Tracheobronchialbaums und des Kehlkopfes. Von Kurt Greinader, Dozent für Röntgenologie an der Universität Berlin. Cloth. Price, 37.30 marks. Pp. 230, with 509 illustrations. Leipzig: Georg Thieme, 1941.

This is an elaborate presentation of the subject of body section roentgenography as applied to the upper air passages. After a chapter setting forth in adequate detail with text and geometric drawings the theory of laminagraphy, also sometimes called planigraphy or tomography, the author proceeds to the discussion of technic as applied to the lungs, the findings in the normal lung, bronchial diseases, nonspecific inflammatory diseases of the lung, lung abscess, differential diagnosis of lung abscess and empyema, foreign bodies, and a long chapter of more than forty pages on lung tumors and bronchial obstructions. Tuberculosis and pneumoconiosis are assigned about seventy-five pages. The remainder of the book is devoted to the trachea and to the larynx.

The illustrations are especially numerous and serve admirably to illustrate the author's contention that there are many lesions of the lung in which tomographic demonstration is much more convincing than the single film and often shows up lesions which cannot be otherwise demonstrated on the x-ray film even when made stereoscopically.

The expense of an instrument especially planned for body section roentgenography is as yet prohibitive for private practice and for many hospitals and clinics, but a fairly efficient equipment can be attached to many of the existing types of radiographic tables which will give valuable help in a certain limited class of cases. In addition to the installation expense, one must consider the additional expense of multiple films necessary for the various sections to procure a film portraying the exact section needed for the study of the part, and also the fact that even in the section under study only a limited field, corresponding roughly to less than an 8 by 10 inch film, can be demonstrated with satisfactory detail.

Polarography: Polarographic Analysis and Voltammetry Amperometric Titrations. By I. M. Kolthoff, Professor and Head of Division of Analytical Chemistry, University of Minnesota, Minneapolis, and J. J. Lingane, Instructor in Chemistry, University of California, Berkeley. Cloth. Price, \$6. Pp. 510, with 141 illustrations. New York: Interscience Publishers, Inc., 1941.

Polarographic or voltammetric analysis was invented about twenty years ago by Jaroslav Heyrovsky, and its subsequent development is largely attributable to his efforts. Its use in analytic chemistry and other fields is due to the fact that when a solution of an electrolyte is electrolyzed in a cell consisting of a dropping mercury electrode and a nonpolarizable electrode it is possible to determine from the resulting current-voltage curve both the nature and the concentration of the reducible or oxidizable substance present. Thus it lends itself to the qualitative and quantitative determination of many inorganic and organic substances and radicals. About 400 journal articles have appeared on the subject of polarography, but this is the first monograph on this subject in English. The eight parts include an introduction, discussion of the many theoretical principles involved, apparatus, inorganic and organic analysis, biologic applications, use of platinum electrodes and amperometric titrations. The appendix includes a list of substances with their respective half-wave potentials in various electrolytes. This appendix is invaluable to any one who contemplates work with a polarograph. The bibliography, indexing and

illustrations are all excellent. This monograph makes available the theoretical and practical aspects of a subject which is rapidly becoming popular with analysts. Literature contributions are summarized and an attempt is made to explain discrepancies in reported results. It should be available in every laboratory possessing a polarograph and to every person interested in the subject.

Abdominal Surgery. By John E. Hammett, M.D., F.A.C.S., Professor of Surgery, The New York Polyclinic Medical School and Hospital, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 356. New York, Toronto & London: Oxford University Press, 1941.

Thoracic Surgery. By Charles W. Lester, A.B., M.D., F.A.C.S., Assistant Clinical Professor of Surgery, New York University, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 141. New York, Toronto & London: Oxford University Press, 1941.

Fractures and Dislocations. By Kenneth M. Lewis, B.S., M.D., F.A.C.S., Assistant Clinical Professor of Surgery, New York University College of Medicine, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 217. New York, Toronto & London: Oxford University Press, 1941.

Histology and Embryology. By José F. Nonidez, Sc.D., Professor of Anatomy, Cornell University Medical College, N. Y. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 199. New York, Toronto & London: Oxford University Press, 1941.

Diseases of the Respiratory Tract. By Jacob Segal, M.D., F.A.C.P., F.A.C.C.P., Attending Physician, Riverside Hospital, New York. Foreword by Harry Wessler, M.D., Director of Medical Service, Bronx Hospital, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 172. New York, Toronto & London: Oxford University Press, 1941.

Obstetrics. By Hervey Clock Williamson, M.D., F.A.C.S., Associate Clinical Professor of Obstetrics and Gynecology, Cornell University Medical College, New York, and George Schaefer, M.D., Assistant Attending Surgeon in Gynecology Clinic, St. Luke's Hospital, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 113. New York, Toronto & London: Oxford University Press, 1941.

Surgery of Head and Neck. By Arthur S. McQuillan, A.B., M.D., F.A.C.S., Clinical Professor of Surgery, New York University Medical College, New York. Oxford Medical Outline Series. Cloth. Price, \$2. Pp. 138. New York, Toronto & London: Oxford University Press, 1941.

Each of the books in this series is in outline form. Each disease or condition is discussed under etiology, pathology, diagnosis, treatment and prognosis; this arrangement, of course, is not followed in the book on histology and embryology. Obviously the outline method has serious limitations and cannot be considered sufficiently detailed to serve as an adequate guide to diagnosis and treatment. It would seem that these books would have their greatest usefulness in assisting preparation for some of the various types of examinations with which physicians are so commonly confronted.

The Vitamin Content of Meat. By Harry A. Waisman, Ph.D., Research Associate in Biochemistry, University of Wisconsin, Madison, and C. A. Elvehjem, Ph.D., Professor of Biochemistry, University of Wisconsin, Boards. Price, \$3. Pp. 210. Minneapolis: Burgess Publishing Co., 1941.

The intensive research on the nutritive value of meat carried on at the University of Wisconsin during the past few years has logically culminated in the publication of this book, which combines the results of these original investigations with a comprehensive review of the literature. Dietitians will be interested in the tables giving the nutritive values of several cuts of meat and in the vitamin losses observed as the result of the cooking methods used in preparing these cuts for the table. The critical review of assay methods and comparison of the results obtained by various methods employed in vitamin assays will be valuable to those interested in determining the vitamin content of foodstuffs. Also of great value is the comprehensive bibliography on the chemistry, physiology, pathology, assay methods and therapeutics of the various vitamins.

A Manual of Bandaging, Strapping and Splinting. By Augustus Thorndike Jr., M.D., F.A.C.S., Associate in Surgery, Harvard Medical School, Boston. Paper. Price, \$1.50. Pp. 144, with 117 illustrations. Philadelphia: Lea & Febiger, 1941.

Although intended primarily for medical students, nurses and orderlies, this handy size paper covered volume is highly recommended to practicing physicians. The book follows the general course given in the department of surgery at Harvard Medical School to second year students. The author presents and describes the technic of the use of dressings, bandages, adhesive plaster and splinting material. In the foreword Elliot Cutler says that "surgeons, like musicians, take pride in their tools and in the performance of their tasks." The illustrations are

the meat of the manual and visualize to the beginner the steps which must be taken to let the young surgeon remember that a neat dressing often bespeaks a good job beneath. The student will soon learn that the principles of support and immobilization entail fundamental concepts in the proper care of injury and infection. Cutler says that especially is this book valuable because of the imminence of worldwide hostilities. The book contains descriptions and illustrations of the dry sterile dressings for clean wounds, septic wound dressings, the treatment for strains, sprains and contusions, dislocations and emergency splinting, the transportation of fracture cases, plaster of paris and similar bandages.

Surgical Diseases of the Spinal Cord, Membranes, and Nerve Roots: Symptoms, Diagnosis and Treatment. By Charles A. Elsberg, M.D., Consulting Surgeon, Mount Sinai Hospital, New York City. With Chapters by Cornelius G. Dyke, M.D., Associate Professor of Radiology, College of Physicians and Surgeons, Columbia University, and Abner Wolf, M.D., Assistant Professor of Neuropathology, College of Physicians and Surgeons, Columbia University. Cloth. Price, \$14. Pp. 598, with 249 illustrations. New York: Paul B. Hoeber, Inc., 1911.

In 1916 Elsberg wrote "Diseases of the Spinal Cord" and in 1925 "Tumors of the Spinal Cord." The present volume is a modern version of both his previous works. Elsberg has been a pioneer in neurologic surgery, particularly specializing in surgery of the spinal cord. From his initial endeavors much of our present surgical technic has arisen as well as considerable knowledge of diagnosis and localization. In this volume Dyke discusses the roentgenologic aspects and Wolf the pathology. The result is an authentic statement of the subject well documented and derived from seasoned experience. The book is beautifully written and well illustrated and should be in every neurologist's library.

The Elegant Eighties When Chicago Was Young. By Herma Clark. With a foreword by John T. McCutcheon. Cloth. Price, \$7.50. Pp. 258, with 36 illustrations. Chicago: A. C. McClurg & Co., 1941.

This book offers a fictitious correspondence between two women who lived in Chicago in the 1880's. That was a period in which medicine in Chicago had many interests. The chapters devoted to 1883 tell the story of Dr. Mary H. Thompson and the Women's and Children's Hospital, where Dr. Sarah Hackett Stevenson began her great career. One hears of the introduction of consumption cures and magnetic belts. The book is made interesting with wonderful reproductions of the personalities who were important in the Chicago of the 1880's. It is beautifully printed and is certain to be a delight to every one who has a taste for the qualities of the more quiet existence of the 1880's. Here too is the story of the founding of the Newberry Library, of the drama and particularly of the interesting society of that period.

Manual for Medical Records Librarians. By Edna K. Huffman, R.R.L., Director, School for Medical Records Librarians, Grant Hospital, Chicago. Cloth. Price, \$3. Pp. 308, with illustrations. Chicago: Physicians' Record Company, 1941.

In this manual, record librarians are given a brief history of medical records and an analysis of the use and value of the medical records and procedures in the medical records department such as organization and management, storage and cross indexing. Qualifications and training of the medical records librarian are discussed and certain of the so-called secondary duties of medical records librarians. There is little doubt that a book of this kind is needed, but it is the reviewer's belief that a considerable amount of obsolete material is included and that somewhat greater emphasis should be given toward the more modern methods and less space occupied in describing those procedures which can no longer be considered up to date.

An Introduction to Medical Science. By William Boyd, M.D., M.R.C.P., F.R.C.P., Professor of Pathology and Bacteriology in the University of Toronto, Toronto. Second edition. Cloth. Price, \$3.50. Pp. 258, with 124 illustrations. Philadelphia: Lea & Febiger, 1941.

This is a volume for orientation, planned primarily to explain to the nurse causes of disease and the bodily changes that occur. When one is able to survey the picture as a whole, individual sections become more clear. The style is simple, direct and understandable by any person of late high school or college education. The book may well be recommended to the general reader as well as to the nurse.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

WEIGHT REDUCTION

To the Editor:—In October 1938 in the *Journal of the Missouri Medical Association*, Werner and Weir published an article on the treatment of obesity in adults. They studied 77 patients; 76 were women, and 75 had obesity of the pituitary type. For the past three months I have been using their method on 6 patients who did not respond to diet alone. (Werner and Weir advocated a diet of about 1,500 calories, the giving of 1 cc. of solution of posterior pituitary intramuscularly twice a week and administration of desiccated thyroid, 1 grain [0.06 Gm.] three times a day.) My results have been surprisingly good. However, this is what is worrying me: Do you believe the patients will regain their former weight when the administration of solution of posterior pituitary is discontinued? Of course I intend keeping them on the low caloric diet.

M.D., New York.

ANSWER.—The article by Werner and Weir to which reference is made does not contain any evidence that the injection of 1 cc. of solution of posterior pituitary intramuscularly twice a week contributed toward the weight reduction of their patients. The use of solution of posterior pituitary by these authors was based merely on inference from the previous work of Raab; their simultaneous use of thyroid and low caloric diets may easily account for the losses of weight which occurred. It is, therefore, most probable that the discontinuation of the use of solution of posterior pituitary will make no difference, providing one continues with the rest of the treatment. However, if it is intended to discontinue the use of thyroid, it is likely that the patients will regain their former weight. For, since they did not respond to dietary treatment alone, it is apparent that they were not ingesting the prescribed diet and, therefore, are still eating sufficient food to maintain their high weight when the metabolic rate is not speeded up by thyroid.

This illustrates the fallacy of weight reduction by medication, unless the patient presents a type of obesity (such as the relatively rare, true hypothyroid obesity) for which thyroid may be prescribed and continued indefinitely. The essence of good treatment for a permanent result in the usual type of obesity is to teach the patient a new and better food habit to replace the previous faulty food habit.

STERILIZATION AND CARE OF HYPODERMIC EQUIPMENT

To the Editor:—How long will rustless needles (for injection purposes) remain sterile without rusting (1) if left in a Castle sterilizer with its lid down for one week or longer, (2) if removed from the sterilizer after boiling for several minutes and then placed in a sterile towel, or (3) if the syringe and rustless needles are wrapped in a dry towel, placed in the sterilizer for sterilization and then removed and allowed to dry and cool? When a physician is called to see a patient, usually in the middle of the night, who is suffering from, say, cardiac asthma, bronchial asthma or severe pain requiring a hypodermic injection of some drug, it is necessary to have a member of the family hunt for a suitable pan or vessel and then to boil the syringe and needle, fill it with water, allow it to come to the boiling point, boil the syringe and needle for five minutes (at least) and then wait another five minutes for the water to cool before removing them from the pan. These procedures will usually require between fifteen and twenty minutes and perhaps longer. Considerable time is accordingly wasted waiting for the syringe and hypodermic needle to be sterilized and ready for the administration of the injection. The question now is How can the syringe and needle be sterilized and kept sterile in order to be ready for instant use when required, whether in one week or several weeks subsequent to their sterilization?

E. L. Hergert, M.D., Brooklyn.

ANSWER.—Any object which is actually sterilized and so wrapped that it is protected against contamination will remain sterile forever. However, the procedures mentioned in the inquiry are not recommended. The Castle sterilizer does not employ steam under pressure. Boiling water or steam at atmospheric pressure may not sterilize in less than thirty minutes. Either of the following methods should be considered:

(a) With needle attached and plunger removed, wrap the syringe in cotton cloth so that it is completely covered by several layers. Place the wrapped syringes on a wire rack at least 2 inches above the water level in a household pressure cooker. Sterilize at 15 pounds steam pressure for twenty to thirty minutes. Turn off the heat and allow the steam pressure to go down. When the pressure is down nearly to zero, open the valve, allow any remaining steam to escape and then open the cooker. The wrapped syringes will be found slightly moist.

Place them in a kitchen gas or electric stove oven at moderate heat; they should be dry within five minutes. (A pressure cooker is actually a small autoclave, and small sizes may be bought from kitchenware furnishers for \$10 or less.)

(b) Many modern gas or electric kitchen stoves have well insulated ovens with thermostatic control. If time allows, there is no better way of sterilizing clean glassware than by dry heat. Glassware is also etched less readily by repeated exposure to dry heat than by steam. Wrap the syringes in cloth as described. Bake them in the oven at about 160 C. (320 F.) for at least two hours.

When wrapped syringes are sterilized by either of these methods, they may be protected from dust and handling by placing them in small paper bags. If they are dry they will remain sterile indefinitely and the needles will not rust, although it is advisable to use "rustless" needles.

DESENSITIZATION TO HORSE DANDER

To the Editor:—A youth aged 18 has had bronchial asthma since he was an infant. It has been necessary for him to live in Tucson, Ariz., the year round until last summer, which he spent here, because all methods of treatment in Memphis have failed to relieve his asthma while in this city. He attends the state university in Tucson and has been told that they will not admit him for the coming season unless he takes injections of "horse dander" to "immunize" him from this substance, to which he is extremely sensitive. The patient requests that I start these injections. It is my opinion that this would be extremely dangerous because of the severe attacks of asthma which he has had. I would appreciate an opinion regarding the proper procedure in such a case.

M.D., Tennessee.

ANSWER.—Immunization against horse dander is a routine procedure and is practiced by almost all men who devote special attention to the subject of allergy. There is little danger to the patient, provided suitable precautions are observed.

A scratch test to horse dander should be done first and, if a pseudopod forms (indicating a four plus reaction), the patient is given on another day a series of intradermal tests with weak dilutions including 1:100,000, 1:1,000,000, 1:10,000,000 and 1:100,000,000 with a control. Desensitization should then begin with that dilution which just fails to give a positive reaction. For example, if the reaction to the 1:1,000,000 dilution is 2 plus and the 1:10,000,000 reaction is negative, start the treatment with 0.10 cc. of the 1:10,000,000 extract. Then the patient should receive 0.15 cc., 0.22 cc., 0.30 cc., 0.45 cc., 0.65 cc. and 0.85 cc. of this dilution followed by similar doses of the 1:1,000,000 dilution. This should be followed by similar doses of the 1:100,000, then 1:10,000, then 1:1,000 extracts. When the 1:100-dilution is reached, begin with 0.15 cc. followed by increases of 0.05 cc. each time. These injections should be given twice a week with the following precautions:

The amount should not be increased if the patient has much local reaction; after this type of reaction the dosage should either be repeated or reduced. Epinephrine 1:1,000 should be on hand in case a general reaction occurs; 0.50 cc. to 1 cc. may be given if necessary. The patient should remain in the doctor's office from fifteen to twenty minutes after the injection has been given.

The results of treatment with horse dander extract have, on the whole, been excellent. Patients should at the same time avoid horses and materials which contain horsehair, such as certain mattresses.

The patient, if not already immunized against diphtheria and tetanus, should be given toxoid either singly or combined so that he will be under no danger of a reaction from horse serum (antitoxin), to which he might react violently.

TOXICITY OF DICHLOROBENZENE

To the Editor:—Can you tell me whether there is danger in the use of dichlorobenzene as a moth exterminant in closets which are frequently opened? Can it be considered one of the benzene carcinogenic chronic irritants?

Jennette Evans, M.D., Ithaca, N. Y.

ANSWER.—Dichlorobenzene exists in the ortho, meta and para forms. Paradichlorobenzene is used fairly extensively in veterinary therapeutics, in agriculture and for the preservation of furs and clothing. There are few references in scientific literature to paradichlorobenzene, and it is only recently that its toxic possibilities have become of interest. A recent paper by Berliner reports the finding of cataracts following the inhalation of paradichlorobenzene vapor, and experimental investigations have led him to conclude that, when inhaled in sufficient quantities, paradichlorobenzene may produce serious toxic effects in human beings and in animals. He warns that the public, medical profession and health authorities should be made cognizant of the potential dangers. Confinement in a closed space with a high

concentration of this moth repellent may cause deleterious effects, but there is no evidence that occasional short exposures may cause untoward reactions. If a closet or room is not air tight there may be sufficient leakage to endanger nearby inhabitants: Berliner mentions a report describing the severe poisoning of a person who lived above a fur cleaning establishment. Another source of potential danger lies in the solvent sometimes used to dissolve dichlorobenzene for use as a spray. These solvents include such toxic agents as carbon tetrachloride, benzene, chloroform and carbon disulfide. The toxicology of carbon tetrachloride, benzene and carbon disulfide are discussed in a number of pharmacology books and in a textbook by Brown- ing. Present knowledge does not indicate dichlorobenzene as being a carcinogenic agent. A case of dermatitis from ortho- dichlorobenzene was reported in THE JOURNAL in 1939, and by cutaneous skin tests the patient was subsequently shown to be very sensitive to this form of dichlorobenzene. On the basis of what we now know, it is fair to say in summary that inter- mittent exposures to the fumes of paradichlorobenzene, as ordi- narily used as a moth repellent, is probably not deleterious, but there is reason to fear that prolonged exposure to this group of compounds or exposure to high concentrations may lead to injury. Clinical reports on the dichlorobenzenes are few in number, and in view of their chemical constitution and wide- spread use under varying conditions they might well be watched carefully.

References:

- Browning, E.: The Toxicity of Industrial Organic Solvents, London, His Majesty's Stationery Office, 1937.
Berliner, M. L.: Cataract Following Inhalation of Paradichlorobenzene Vapor, *Arch. Ophth.* 22: 1023 (Dec.) 1939.
Downing, J. G.: Dermatitis from Orthodichlorobenzene, *THE JOURNAL*, April 15, 1939, p. 1457.

NEURITIS OF TROCHLEAR NERVE AFTER INFLUENZA

To the Editor:—Following an attack of influenza a man aged 56 had a paralysis of the trochlear or fourth nerve of the eye. The only symptom is double vision when looking downward. There is a high esophoria in the lower quadrant of about 16 diopters, 8 diopters in the midline and 6 when looking upward. There is normal vision in both eyes for both near and far. The fundus is normal. The Wassermann reaction has been taken and is negative. There is a history of chronic sinusitis with allergy, seasonal hay fever. The antrum on the affected side was washed and considered negative. A roentgenogram shows more involve- ment of the left ethmoids than on the opposite side. These pictures were taken during the hay fever season. The diagnosis made was paralysis of the left fourth nerve due to ethmoiditis. Multiple sclerosis was con- sidered, but, since there was no symptom with the exception of the paralysis, all other diagnoses were eliminated. The patient can play golf and is not troubled with diplopia at any other time. As stated, the diplopia is present only when the patient is looking extremely down- ward.

M.D., Oregon.

ANSWER.—If there are no other signs or objective evidences of organic disease of the central nervous system, the patient probably has a neuritis of the left trochlear nerve. This, no doubt, followed the attack of influenza. To have this nerve involved alone is rare. Usually the ciliary muscle, the sphincter pupillae and the external ocular muscles are also involved. The paralysis may be obstinate in recovering. Thiamine hydro- chloride may be given hypodermically in doses of 100 mg. daily for at least three weeks. Large amounts of liver should be eaten. Jello at least once daily should be consumed for its aminoacetic acid content. Ephedrine sulfate, $\frac{3}{8}$ grain (0.024 Gm.) twice daily by mouth, should be tried for at least two weeks. The patient should be observed and reexamined at least once a month to determine the presence of other objective evi- dence of organic disease of the central nervous system.

DETERMINATION OF SPECIFIC GRAVITY OF BLOOD

To the Editor:—I have been asked for a simple method for determining the specific gravity of blood. This is to be used as an indicator of internal hemorrhage. I know of no accurate method for specific gravity of blood, which could be carried out in a small laboratory, which would be sufficiently sensitive to be of value. Can you tell me of such a method or where I might find it?

M.D., Oklahoma.

ANSWER.—The specific gravity of whole blood plasma and other body fluids is easily and accurately done by the falling drop method of Barbour and Hamilton. In this procedure the time required for a test fluid to fall a fixed distance in a mixture of a certain specific gravity is determined. The method is thoroughly described in numerous articles (Bellis, C. J.: A Rapid Method of Specific Gravity of Body Fluids by the Falling Drop Method, *J. Lab. & Clin. Med.* 26:564 [Dec.] 1940).

The measurement of the specific gravity of whole blood has been used to determine internal hemorrhage. The method may

reveal relatively small changes in blood volume (Foote, M. N., and Gerst, G. R.: Practical Application of the Falling Drop Method for Determining Surgical Prognosis, *Am. J. Surg.* 50:316 [Nov.] 1940).

The apparatus for determining the specific gravity of the fall- ing drop method can be obtained from laboratory supply houses.

CONGENITAL MALFORMATION OF OUTER EAR

To the Editor:—A child 2 days old has a unilateral congenital defect of the ear with absence of the external auditory meatus. The covering of this opening is like the skin elsewhere in the auricle. The entire auricle is present, somewhat smaller and a little more "crumpled" than the right ear, which is entirely normal in all respects. Whether there is a canal behind this closure, I do not know. Should one puncture this membrane with a small caliber needle to determine the presence of an external auditory canal? If so, at what age? Should suspicions of a canal arise, when (age period) and how should this be incised (type of operation)? How frequently is this abnormality encountered? How frequently is a canal found in this condition? Does one find intact hearing apparatus behind such a membrane?

Eugene Bernstein, M.D., New York.

ANSWER.—Congenital malformations of the outer ear with absence of the external auditory meatus are usually associated with absence of the drum membrane, although in rare instances the inner end of the ear canal may be developed with a drum membrane while the outer end is covered over with skin. A properly taken roentgenogram should help to indicate whether or not there is a normally developed osseous canal. Careful hearing tests with masking will reveal the condition of the hearing and will indicate whether or not the perceptive mechanism is properly developed and will give some indication of the presence or absence of a normal conducting mechanism.

Plastic reconstruction of the external auditory canal rarely results in improvement in hearing, since the drum membrane is usually not developed. Such an operation may be desirable for cosmetic reasons, especially in a boy, but it is best delayed until the age of 10 or later, when the normal development of the osseous external auditory canal is completed, and at this age accurate hearing tests can be secured.

EFFECTS OF SYNTHETIC RESINS

To the Editor:—A patient works with Plaskon molding compound, which is made by an Ohio company. This is apparently a formaldehyde for- mula of a plastic. He complains of a dry cough. Can you advise me or refer me to work on the effects of plastics on workers?

C. Spencer Bond, M.D., Rochelle, Ill.

ANSWER.—Plaskon is a synthetic resin of the urea-formalde- hyde type. In its manipulation, and particularly in hot opera- tions, gaseous formaldehyde may be evolved. Toxicity chiefly centers about this gas, although nongaseous constituents or derivatives may act as irritants or sensitizers. Dermatitis is the best known of injurious actions, although cases are infre- quent compared to some other plastic resins. Bronchitis and other forms of respiratory tract inflammation have occurred in hot molding work. Formaldehyde is the probable cause. Respiratory action, chemistry and cutaneous injuries respectively are described in the following publications:

- Krans, E. W.: Effects of Fumes During the Molding of Certain Types of Plastics, *Indust. Med.* 4: 10 (Jan.) 1935.
Howald, A. M.: Systematic Study Develops New Resin Molding Com- pound, *Chemical and Metallurgical Engineering* 38: 583, 1931.
Schwartz, Louis, and Tulipan, Louis: Occupational Diseases of the Skin, Philadelphia, Lea & Febiger, 1939.

TRAUMA AND DIABETES

To the Editor:—An infant aged 13½ months contracted diabetes mellitus. I should like to know whether a blow she received on the head six months ago could contribute to the development of the disease. A week before she became ill I gave her the first dose of whooping cough vaccine. A few days later she appeared to have a slight pharyngitis, and this became progressively worse. I put her on sulfanilamide, and the following day I discovered that she had much sugar in the urine.

Thomas Dechair, M.D., Westmoreland, Kan.

ANSWER.—A blow on the head may cause glycosuria but, fortunately, does not cause diabetes mellitus. This can be stated definitely for other reasons than the well known absence of diabetes following head injuries in war, athletics, automobile accidents and the many accidents of childhood. To cause dia- betes, at least nine tenths of the pancreas must be destroyed.

Joslin, Root, White and Marble (*The Treatment of Diabetes Mellitus*, ed. 7, Philadelphia, Lea & Febiger, 1940) give a detailed review of trauma and diabetes. The most recent dis- cussion may be found in the second edition of *Trauma and Disease* (Philadelphia, Lea & Febiger), now in press, by Braddy and Kahn, in which the chapter on trauma and diabetes was prepared by Joslin and his associates.

Vaccines and the new chemotherapeutic agencies have not been shown to lead to diabetes.

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THE SUDDEN DEATH OF PATIENTS WITH FEW SYMPTOMS OF HEART DISEASE

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AND

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The sudden death of a patient with disease of the coronary arteries is rarely instantaneous in the sense that the person appears perfectly well one minute and is dead the next. It is instantaneous in the sense that a person with few or many symptoms suddenly ceases to live. The absence of a gradual decline in strength that might indicate a fatal outcome contributes to the unexpectedness of this type of death. In the first few hours or days after the appearance of symptoms that should suggest interference with the coronary blood supply, myocardial insufficiency is seldom severe enough to cause fatal congestive failure, and warning of impending difficulty that is obvious to the casual observer is often lacking. The type of patient we wish to discuss belongs in a strictly limited group: He does not have the dramatically severe syndrome of excruciating thoracic and brachial pain with shock and collapse. Nor does he necessarily show soon after the infarction striking evidence of congestive failure, such as pulmonary edema, orthopnea or failure of the right ventricle. The 10 whose histories we present were selected from a large number of patients observed during the past year by one of us (Dr. Snider) in the course of his routine work as coroner's physician in Cook County. These patients all died suddenly, many in the course of their ordinary activities, unattended by a physician and in circumstances that brought the death to the attention of the coroner. Such clinical information as was available, with the observations at necropsy, is presented briefly in the case histories. The pertinent data are summarized in table 1.

Symptoms which reasonably could be attributed to myocardial infarction were present in all the patients. The duration of symptoms before sudden death varied from three hours to ten days. Six patients had each consulted a physician who had interpreted the symptoms incorrectly and was genuinely astonished when the patient died suddenly. In 3 cases the patient died when a large infarct of the left ventricle ruptured. One patient was straining on a bed pan, 1 was sitting quietly

in a chair and 1 was driving his automobile. Their premonitory symptoms were no more striking than the ones experienced by patients in whom the infarct was smaller. It is outside the scope of this report to discuss the phenomenon of the development of huge infarcts with few symptoms, but it is pertinent to bear in mind that extensive myocardial destruction may occur with little obvious evidence of congestive failure. The important issue raised by contemplation of the remaining 7 patients is an adequate explanation of the mechanism of death. Three (patients 8, 9 and 10) had no readily discernible infarction of the myocardium. In them a portion of the muscle was softer than the rest and slightly discolored but no frankly necrotic changes were visible. Invariably one finds more or less recent changes in the coronary vessels that supply the softened area. It is important to emphasize here that the mode of death is no different from that which occurs with the classic syndrome of coronary occlusion during the first few days. In the remaining 4 patients (patients 4, 5, 6 and 7) the infarct discovered at autopsy was small, often no larger than the healed fibrous areas so frequently seen in the myocardium. All 7 patients in whom the ventricle was not ruptured were chosen because the infarct was either small or recent. This was done to emphasize the fact that the death of such patients can scarcely be explained as the result of loss of an important portion of the cardiac musculature.

It must be pointed out that complete obliteration of the artery supplying the infarcted region is not at all necessary. In the patients in whom the ventricle was ruptured, occlusion of a coronary artery by thrombosis was complete. In 4 of the 7 others (patients 5, 6, 9 and 10) occlusion was complete, but in 3 (patients 4, 7 and 8) there was only partial restriction of the vascular channels. Of a recently reported large series of necropsy studies¹ of hearts with myocardial infarction, only 60 per cent showed complete thrombosis of a coronary artery. The rest of the hearts had acquired the infarction as a result of changes in the vicinity of an atherosclerotic plaque or around the coronary ostia which seriously embarrassed without actually shutting off the coronary blood flow. The changes around the ostia were usually syphilitic, and those around the plaque were subintimal hemorrhages, ruptures of the plaque or hemorrhages into the area of atheroma.²

One may summarize the observations presented and the general attitude of clinicians on sudden death from cardiac disease as follows:

1. Examination of the heart of a victim of sudden death rarely fails to disclose lesions in one or more of

Dr. LeRoy is Searle Research Fellow.
This study was aided by a grant from the Billings Medical Club of Chicago.

From the Department of Medicine, Northwestern Medical School, and St. Luke's Hospital.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Pharmacology and Therapeutics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Master, A. M.; Gubner, Richard; Dach, Simon, and Jaffe, H. L.: Differentiation of Acute Coronary Insufficiency with Myocardial Infarction from Coronary Occlusion, *Arch. Int. Med.* **67**: 645-657 (March) 1941.

2. Horn, Henry, and Finkelstein, L. E.: Arterio-sclerosis of the Coronary Arteries and the Mechanism of Their Occlusion, *Am. Heart J.* **19**: 645-682 (June) 1940.

the coronary arteries which impede or obstruct the blood flow. In location and extent these lesions often cannot be distinguished from similar ones in patients dead from other causes.

2. The myocardium of a victim of sudden cardiac death nearly always contains an infarct. In the relatively few instances in which there are no symptoms antecedent to death, neither a softening nor a clearly demarcated infarct may be found in association with the vascular lesion. In all patients who have had symptoms—however mild—for a few hours or more before death, the myocardium is damaged. The infarct if early is simply a softened darker red area with some dilatation of the arterioles in the overlying epicardial fat; or there may be a discrete region of muscular necrosis with hemorrhagic discoloration and fatty changes. The infarct may be of any size and in any position; in this respect it differs in no way from the fibrous scar of a healed infarct that is seen so frequently.

In an effort to explain the paradox that presumably identical cardiac vascular and muscular lesions may or may not cause sudden death, most writers have assumed

The effect of the ligation of a coronary artery of dog has been studied by many workers. The number of animals that survived after ligation of the circumflex branch of the left coronary artery varied considerably. In table 2 are collected some of the earlier data. In 1939 Hall and his colleagues⁴ reported the first of great many experiments in which ligation was performed on conscious animals through the tightening of a previously applied loose ligature. In general the workers were studying alterations in mortality that followed various disturbances of the innervation of the heart. When one of us (Dr. LeRoy) in 1940 commenced a study of this problem, an attempt was made to prepare anesthetized animals which would have the same mortality as conscious ones. The considerations behind this step were not entirely humanitarian. It was thought, however, that the subjective sensation of pain evidenced by the conscious dog might reinforce an existing reflex or even initiate one. The fact that use of anesthesia with morphine and pentobarbital sodium resulted in the same mortality as that for conscious dogs seems to indicate that the sensation of pain

TABLE 1.—Summary of Case Histories

Patient	Age	Sex	Symptoms		Autopsy		Medical Case
			Duration	Type	Myocardium	Arteries *	
1	50	♂	7 days	Pain in chest, dyspnea	Rupture, infarct, left ventricle	Thrombosis, L A D	No
2	56	♂	3 days	Cold in chest, cough	Rupture, infarct, left ventricle	Thrombosis, L A D	Yes
3	60	♀	10 days	Substernal pain, cough	Rupture, infarct, left ventricle	Thrombosis, L A D	Yes
4	45	♂	16 hours	Fatigue, tightness in chest	Infarct, 2 × 3 cm, apex and septum	Subintimal hematoma, L A D.	No
5	41	♂	4 days	Dyspnea, pain in arm	Infarct, 2 × 2 cm, apex, left ventricle	Thrombosis, R C A.	Yes
6	39	♂	24 hours	Pain in arms	Infarct, 4 × 5 cm, left ventricle	Thrombosis, L C A.	Yes
7	32	♀	4 hours	Nausea, dyspnea, fear	Infarct, 6 × 7 cm, left ventricle	Stenosis, coronary ostiums	Yes
8	49	♂	10 days	Angina pectoris	Softening of apex	Diffuse sclerosis	No
9	41	♂	3 hours	Nausea, substernal pain	Softening, posterior wall of left ventricle	Thrombosis, both circ.	Yes
10	43	♂	4 hours	Nausea, vomiting	Softening of base and septum	Subintimal hematoma, A B R C A.	No

* L A D., anterior descending branch, left coronary artery; R C A., right coronary artery; L C A., circumflex branch, left coronary artery. A B R C A., aberrant branches, right coronary artery; both circ., circumflex branches, right and left coronary arteries

the intervention of some sort of a reflex disturbance of cardiac function severe and sudden enough to prove fatal. Ventricular asystole and ventricular fibrillation³ have been demonstrated as the terminal mechanism in the few instances in which electrocardiograms were being made when death occurred. The majority of patients died with ventricular fibrillation, but the mode of its development has not been clearly understood. It is obvious that insight into the causation of this fatal arrhythmia should provide clues to aid one in combating its onset. The greatest difficulty in reconstructing the series of events responsible for a sudden death is that this must be done in retrospect, with only dead tissues as building materials. Other difficulties are the variability of the vascular and muscular lesions and—as we have indicated—the fact that similar lesions may not cause death. Finally, it is apparent that age, physiologic condition and inherent biologic differences must be important determining factors. Animal experimentation eliminates fairly well most of the confusing factors except the inherent ones. We think these are the most important.

a by-product rather than an essential feature of the mechanism of sudden death. This phase of our work was prompted by study of patients of the type referred to earlier, in whom pain was a minor element in the series of events that followed occlusion of a coronary artery.

In our laboratory a strictly standardized procedure is followed for the production of acute coronary occlusion. After the induction of morphine and pentobarbital sodium anesthesia (aseptic precautions being observed) in a dog a ligature is placed on the circumflex branch of the left coronary artery. Subsequently the heart may be left exposed for direct observation and color photography.⁵ In other dogs the thorax was closed, and the effect of certain drugs on survival was studied. With a large number of such preparations the mortality after coronary occlusion was 75 per cent. The value is the same as that found by Hall and by us for conscious animals. In the discussion of our results, and

3. Thompson, Iran: Ventricular Fibrillation Causing Sudden Death, *J. A. M. A.* **116**: 2583-2585 (June 7) 1941. Goodrich, Ben E., and Needles, R. J.: Terminal Cardiac Mechanism in Coronary Artery Disease, *Am. Heart J.* **20**: 637-640 (Nov.) 1940. Weiss, Soma: Instantaneous "Physiologic" Death, *New England M. J.* **223**: 793-797 (Nov. 14) 1940

4. Manning, G. W.; McEachern, C. G., and Hall, G. E.: Reversible Coronary Artery Spasm Following Sudden Occlusion of Other Coronary Branches, *Arch. Int. Med.* **64**: 661-674 (Oct.) 1939. McEachern, C. G., Manning, G. W., and Hall, G. E.: Sudden Occlusion of Coronary Arteries Following Removal of Cardiac Sensory Pathway, *ibid.* **65**: 661-670 (Apr.) 1940.

5. When this paper was presented at the Annual Session a color film was shown.

in our comments on Hall's work, the phrase sudden death will be applied to animals which died within twenty-four hours after ligation of the circumflex branch. All mortality referred to concerns only cases of sudden death.

The sequence of events after the occlusion of the circumflex branch of the left coronary artery is as follows:

1. At the instant of occlusion the blood pressure falls suddenly, and a shower of extrasystoles or well defined bradycardia appears during an interval of about fifteen seconds. The electrocardiogram is usually unchanged for at least thirty seconds. The conscious dog may or may not experience pain.
2. One minute after occlusion the blood pressure may be lower or normal. A well demarcated zone of ischemia is present in the part of the heart deprived of its blood supply. Typical electrocardiographic changes are occurring: elevation of the RS-T segment in all leads, with exceptionally high elevation in leads 2 and 3. The pulse is generally more rapid, and a variable number of extrasystoles occur.
3. Five minutes after occlusion the blood pressure is usually falling; the pulse is more rapid, and showers of extrasystoles and short runs of ventricular tachycardia are seen in most dogs. The myocardial infarct is deeper in color, and the ischemic myocardium bulges outward during systole. The electrocardiographic changes are more prominent. In the conscious dog there is usually evidence of more or less pain, altered respirations and struggling.
4. At any time after five minutes one can see little further alteration in the situation. The infarct may become somewhat darker, and the arrhythmias are more frequent and more prolonged. In the animal destined to die suddenly the only difference one can see is a greater amount and variety of arrhythmias.
5. Suddenly the entire uninfarcted part of the myocardium is seen to swell; dilation of the heart is occurring. The uninvolved part of the myocardium at the same time becomes darker until the margin of the infarct disappears. The contractions of the ventricle become feeble, rapid and irregular, and paroxysmal ventricular tachycardia is recorded electrocardiographically. Suddenly a portion of the uninfarcted area of the myocardium begins to fibrillate, and in a few seconds the process spreads until generalized ventricular fibrillation is established. The blood pressure has then fallen to zero, and the dog, after giving a convulsive gasp, is dead.

This description is a synthesis of about fifty observations made on conscious animals and on suitably anesthetized ones with the heart exposed. Colored motion pictures of many preparations were taken and studied

vasoconstriction subsequent to the myocardial infarction. This is clearly seen in the animal (and is shown in the colored pictures) when the uninfarcted part of the myocardium gradually becomes as dark as the infarct just before ventricular fibrillation commences. The existence of such a coronary vasoconstriction has been demonstrated by us in other experiments, in which the

TABLE 3.—Mortality After Ligation of Circumflex Branch of Left Coronary Artery

Experimental Conditions		Incidence of Sudden Death, Percentage	Investigator *
Anesthetic	Modifying Circumstances		
None	Both stellate ganglions and upper five thoracic sympathetic ganglions removed	10	H
None	One stellate ganglion and upper five thoracic sympathetic ganglions on same side removed	33	H
Ether (deep anesthesia used)	None	25	H
Morphine-pentobarbital sodium	Xanthine drugs administered after ligature	25	L
Morphine-pentobarbital sodium	Atropine sulfate administered	35	L
None	Atropine sulfate and xanthine .	50	L
None	Quinidine sulfate administered	55	H
None	Papaverine hydrochloride administered	60	H
None	None .	75	H
Morphine-pentobarbital sodium	None...	75	L
None	None .	75	L

* H, Hall, of Manning, McEachern and Hall; L, LeRoy

blood flow in one coronary artery was measured with a thermostromuhr while another artery was ligated. It seems apparent to us that the ischemia of the myocardium is provoked by a reflex coronary vasoconstriction and that it is the factor that causes ventricular fibrillation in the animal whose myocardium is susceptible to the development of this arrhythmia. The main pathways of the reflex arc may be inferred from existing data. Many workers have shown that painful afferent impulses from a myocardial infarct travel centrally through the cardiosensory nerves, the stellate ganglions and the upper five or six thoracic sympathetic ganglions. These workers have shown also that cardiosensory denervation prior to infarction reduces the mortality strikingly. The efferent impulses provoking vasoconstriction must travel from the brain to the coronary arteries in the vagus nerves, since they are the only generally accepted conductors of such activity.

Many experiments were performed in Hall's laboratory and in ours in an attempt to modify the incidence of sudden death after experimental coronary artery occlusion. In table 3 are collected the data. The greatest reduction in mortality occurs when the afferent portion of the lethal reflex arc is interrupted surgically: Bilateral removal of the stellate ganglions and the upper five thoracic sympathetic ganglions reduced the mortality in conscious dogs from a control value of 75 per cent to only 10 per cent. Unilateral sympathectomy reduced the mortality to only 33 per cent. Surgical ether anesthesia sufficiently depresses all reflex activity, so that ligations in which it was used resulted in a mortality of only 25 per cent. On the other hand, light anesthesia with morphine and pentobarbital sodium had so little influence on the reflex in question that the mortality was the same as for conscious dogs, 75 per cent. Administration of atropine sulfate in appropriate

TABLE 2.—Mortality After Experimental Occlusion of Circumflex Branch of Left Coronary Artery

Investigator	Mortality, Percentage
Cohnhelm and von Schulthes-Rechberg	100
Porter	64
Smith	57
Clerc and associates	100
Parade	100

* See also Burchell, H. B. Adjustments in Coronary Circulation After Experimental Coronary Occlusion, Arch Int Med 65: 240-263 (Feb.) 1940

carefully. In every respect our description of the sudden death of a dog with experimental coronary occlusion agrees with that published by the Toronto workers. One feature that we have seen is that when death occurs rapidly—that is in less than thirty minutes—no infarct is visible afterward, whereas if the dog survives longer a distinctly darker infarct is found.

The main feature of the experiments is the clear demonstration that there is a generalized coronary

doses reduced the mortality to about 35 per cent. A death rate of 25 per cent was observed after the administration of active coronary vasodilating drugs, the xanthine derivatives theobromine and theophylline. When atropine sulfate and theophylline with ethylenediamine were used, the death rate, in conscious dogs, was 30 per cent. Use of quinidine sulfate, which has no action on either the coronary vessels or the reflex arc, reduced the mortality to only 55 per cent.

From the experiments described one can safely conclude that sudden death after ligation of a coronary artery is due to ventricular fibrillation.⁶ This arrhythmia is caused by generalized myocardial ischemia, which is accomplished by active vagal coronary vasoconstriction. This unfortunate stimulation of the vagus is produced reflexly by afferent impulses arising in the myocardial infarct and transmitted centrally through the sympathetic nerves. Amelioration of the vagal vasoconstriction, whether by cardiosensory denervation, by the use of atropine, by deep surgical anesthesia or by active coronary vasodilatation secured with the xanthine drugs, reduces the incidence of sudden death appreciably. The extent to which the reflex operates in the absence of efforts to interfere with it depends on certain inherent biologic phenomena: the stimulation threshold of the cardiosensory sympathetic nerves, the tone of the vagus and the susceptibility of the uninfarcted part of the myocardium to the influence of ischemia. Certainly these factors are difficult if not impossible to evaluate.

We think it is perfectly reasonable to apply to human beings the information derived from our studies on dogs. In each one observes the same unpredictable outcome from apparently similar lesions. In each sudden death is obviously not due to simple failure of the contractile power of the myocardium in the infarct alone. In most cases in which sudden death of a patient with recent coronary occlusion has been studied electrocardiographically, the same mechanism—ventricular fibrillation—has occurred that we have seen in the dog. Therefore it is reasonable to employ the means discovered by experimentation on the dog in an attempt to reduce the mortality among patients.

We think the data we have presented are important for two reasons. First, the realization that reflex phenomena are responsible for the sudden death of a patient with myocardial infarction is valuable. Appreciating this, one should be less prone to pass over lightly mild symptoms or mild physical signs that suggest coronary artery disease. Bearing in mind that these mild symptoms may be the sole evidence of an infarct that can at any moment initiate fatal ventricular fibrillation, one will be less likely to ignore them. The sudden onset in a previously healthy person of substernal oppression, mild pain, symptoms of indigestion or brachial pain or discomfort unrelated to injury should arouse suspicion. Suspicion should be doubled if the symptoms are aggravated by exertion, especially if they are associated with dyspnea. Dyspnea and fatigue occurring suddenly and experienced under conditions under which it is not usually felt should always excite suspicion. With suspicion aroused, the patient should be examined with great care. We have little doubt that most patients with mild symptoms of myocardial infarction have some discoverable cardiac abnormality, such as showers of extrasystoles, pulsus alternans, perhaps a friction rub

and a blood pressure lower than the usual reading. If facilities are available an electrocardiogram should be made, and small deviations from normal—particularly in the RS-T segment—should be given serious consideration. The most important point clinically is that suspicion rather than certainty should govern one's conduct.

The second reason why we attach significance to the facts presented is that an answer is supplied to the question of the physician who says "All right, this patient may have a myocardial infarct; but what can be done about it while the symptoms and signs are so indefinite except to wait and see and to meet whatever situations arise?" The fault in this attitude, of course, is that the first serious change in the patient's status may be the onset of fatal ventricular fibrillation! The animal studies offer some indications of useful, reasonable therapeutic measures, and from them we have learned that certain agents are available which will minimize or counteract the lethal reflex. Rest alone for the patient suspected of having a myocardial infarct is undoubtedly valuable, because it decreases the demand of the myocardium for blood and thus lessens the effect of any coronary vasoconstriction that might occur; but rest is not enough. Atropine and the coronary vasodilator drugs, such as the salts of theobromine and theophylline, can be given in large amounts by several routes and with no risk. The doses of these drugs that we have used for dogs are approximately equivalent to the doses for human beings. Of atropine sulfate we give dogs about one half the atropinizing dose, or 0.1 mg. per kilogram of body weight. As to patients, one-half the atropinizing dose is about 0.8 mg. ($\frac{1}{15}$ grain), given intravenously, for the usual adult. Of aminophylline (theophylline with ethylenediamine), for example, we give patients and dogs an initial dose of 5 to 10 mg. per kilogram of body weight intravenously. The usual amount for an adult is 0.48 Gm. in 20 cc. of solution, given intravenously and slowly. The injection may be repeated every four or six hours as the situation suggests. Surely in case of doubt one can do no harm by giving such amounts of atropine and a xanthine derivative while one waits to see what will happen or while one waits for an electrocardiogram to be made. Naturally not all patients who are so treated will survive; but if the same ratio observed in dogs should hold for human beings 1 of 3 will die, instead of 3 of 4. The reduction in mortality is certainly a worth while advantage. It is hard indeed for us to escape the conclusion that many victims of heart attacks whom the coroner's physician sees would not have died had atropine and one of the xanthine derivatives been given and complete bed rest insisted on soon after the onset of the symptoms.

CONCLUSIONS

1. The myocardial infarct responsible for sudden death need not be so large that muscular failure alone is responsible.
2. Myocardial infarction may occur without complete closure of a coronary artery and without the classic syndrome of pain, shock and collapse.
3. A myocardial infarct usually causes some symptoms, even though they may be mild.
4. The sudden death of a patient with infarction of the myocardium is due to a reflex coronary vasoconstriction whose stimulus is the infarct, whose afferent pathway is the cardiosensory innervation and whose efferent pathway is the vagus. The result of this reflex vasoconstriction in a susceptible person is fatal ventricular fibrillation.

6. In our experiments a few instances of partial auricular-ventricular block were seen, but in no case in which death was observed was this the terminal mechanism. The experience of Hall and his associates⁴ was similar.

5. The probability of the establishment of this lethal reflex may be decreased by use of certain drugs (atropine and the xanthine derivatives), by cardio-sensory denervation and reasonably but to a lesser extent by simple rest in bed.

REPORT OF CASES

CASE 1.—A man aged 50 had complained for about one week of slight but increasing substernal pain. Three days before death increasing dyspnea, orthopnea and more severe pain occurred. He was up and around during the entire time but had received no medical care.

Necropsy disclosed moderate hemopericardium, the origin of which was a small perforation of an aneurysmal dilatation of an infarct of the lateral wall of the left ventricle. Complete occlusion by a thrombus of the descending branch of the left coronary artery was found.

CASE 2.—A man aged 56 ran into a tree while driving home from work. He was dead when passersby reached the wreck. Three days previously he had consulted a physician because of a "cold in the chest" and had received some sort of medication.

Necropsy disclosed moderate hemopericardium, the origin of which was a large rupture of an infarct of the posterior surface of the left ventricle. A complete occlusion of the more distal portion of the circumflex branch of the left coronary artery by a thrombus was observed.

CASE 3.—A woman aged 60 was bedridden, convalescing from a seven week old fracture of the femur. Ten days before death she complained of substernal tightness to her physician, who visited her regularly. This was diagnosed and treated as a "flu-like cold in the chest." Three days before death she had increasingly severe substernal pain, coughing and dyspnea. She died suddenly while getting off a bedpan.

Necropsy disclosed moderate hemopericardium, the origin of which was a large rupture of an infarct at the apex of the left ventricle. A complete occlusion by thrombosis of the anterior descending branch of the left coronary artery was observed. This had formed on a calcified atherosclerotic plaque 1 cm. below the origin of the vessel.

CASE 4.—A man aged 45, a pharmacist, had had a headache all day and had felt tired. About an hour before death he experienced a constant tightness in his chest. He fell over suddenly behind a counter, dead.

Necropsy disclosed a 2 by 3 cm. infarct at the apex of the left ventricle. The anterior descending branch of the left coronary artery was incompletely occluded by an atheromatous plaque, elevated by a fresh subintimal hemorrhage. The left coronary artery was small in caliber, less than one-half the usual size. The posterior wall of the left ventricle was supplied almost entirely by a large branch of the right coronary artery.

CASE 5.—A man aged 41, a linesman, died suddenly at work on a pole. His widow stated that for the preceding four days he had complained of breathlessness and of "neuralgia" in his left arm, aggravated by exertion. He had seen a physician on the morning of the day of his death and had received some pills.

Necropsy disclosed a small infarct, about 2 by 3 cm. in size, with beginning fatty necrotic changes at the apex of the heart involving the septum. A small thrombus attached to an ulcerated atherosclerotic plaque partly occluded a posterior descending branch of the right coronary artery.

CASE 6.—A man aged 39, a milkman, experienced moderately severe pain across the chest and in both arms the day before he died. Despite this pain he was able to finish his deliveries. On his way home he saw a physician, who gave him some pills. He slept poorly but went to work the next day. He was found dead on a prairie a short distance from the start of his milk route.

Necropsy disclosed a 3 by 4 cm. infarct on the lateral wall of the left ventricle. The circumflex branch of the left coronary artery was completely occluded by a thrombus fixed to an ulcerated atheroma.

CASE 7.—A woman aged 32 became nauseated while sitting quietly at home. With the gastrointestinal disturbance there was some substernal tightness and a sensation of fear. A physician was called who diagnosed "intestinal flu" and prescribed some medicine. She lay down to rest and was found dead four hours after the onset of symptoms.

Necropsy disclosed a large infarct of the posterior, apical and septal regions of the left ventricle. The ostium of the left coronary artery was reduced to a diameter of 1.5 mm. by an encircling gumma. The ostium of the right coronary artery was completely obliterated by a recent subintimal hemorrhage in the syphilitic infiltration of this region. Large gummatous pads, some with recent subintimal hemorrhages, encircled the root of the aorta and separated the attachments of the valves.

CASE 8.—A man aged 49, a bricklayer, died suddenly at work. During the preceding week or ten days he had complained of moderate precordial pain on effort. About a year earlier he had suffered from what was diagnosed as coronary occlusion, but the electrocardiogram was asserted to have been "negative."

Necropsy disclosed a slight softening of the apical region, with no distinct infarction. The small blood vessels in the epicardial fat of this region were widely dilated. The anterior descending and the circumflex branches of the left coronary artery were completely occluded by old calcific lesions. There was a diffuse fibrous scar in the posterior wall of the left ventricle. The right coronary artery was smaller than usual, and anomalies of both arteries were seen.

CASE 9.—A man aged 41, a salesman, became sick at work, with gastrointestinal disturbances, substernal pain and little or no evidence of shock. He was taken to a hospital, where his symptoms decreased after morphine was given. He suddenly collapsed and despite efforts at resuscitation died suddenly three hours after the onset of symptoms.

Necropsy disclosed a recent barely discernible infarct of the posterior wall of the left ventricle and of the septum. This was apparently due to occlusion by fresh thrombi attached to atherosclerotic plaques in the circumflex branches of both coronary arteries. There was an old fibrous scar, 3 by 4 cm. in size, in the anterolateral wall of the left ventricle. This was in relation to an old, fibrous, complete occlusion of the anterior descending artery.

CASE 10.—A man aged 43 died suddenly while changing his clothes before starting to work in a factory. He had complained that discomfort in the upper part of the abdomen had awakened him, and he had eaten no breakfast. He had a flannel binder pinned about his abdomen.

Necropsy disclosed a faintly defined infarct around the base of both ventricles and in the region of the septum adjacent. The discoloration extended into the interauricular and the inter-ventricular septums. No septal branch of the left coronary artery could be found. There were two tiny aberrant ostiums in the anterior sinus of Valsalva in addition to the ostium of the right coronary artery. Vessels from the two small ostiums, almost completely occluded by fresh subintimal hemorrhages, were traced to the infarct.

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ABSTRACT OF DISCUSSION

DR. G. K. FENN, Chicago: The paper of Drs. LeRoy and Snider has attracted my attention for two reasons. First, I have been greatly interested in reflex effects on the coronary circulation. I suspect that such effects may be initiated in many places, both in the heart and from extracardiac sources. Two years ago, before this section and on the same program with Dr. Hall, Dr. de Takats and I submitted evidence which led us to believe that reflex coronary constriction accompanied pulmonary embolism. Last year Drs. Gilbert, LeRoy and I tried to convince this section that we had demonstrated the occurrence of such reflexes arising in the gastrointestinal tract. Now, Drs. LeRoy and Snider have built up a rather clearcut case to show that patients die following unsuspected interference with the coronary circulation and that many of these deaths are not due to the infarct per se or to congestive heart failure. They have integrated these occurrences into experimental work

which seems to indicate quite clearly that many of these deaths are due to reflex coronary constriction with its attendant phenomena, notably ventricular fibrillation. I do not see how we may disregard any longer the importance of these reflex effects. I am interested secondly because of the altered therapeutic approach to the problem that has grown out of all this work. Not long ago morphine was the only drug that received much attention in the treatment of acute coronary occlusion. Now morphine does not overcome the reflex constriction. Indeed, it has been accused of accentuating such effects. Certainly morphine did nothing toward saving the life of the experimental animals. It seems clear therefore that, when morphine must be used, and it frequently must be or is used, something should be added to offset its vagal action. Dr. LeRoy has pointed out the advantages derived from atropine and drugs of the xanthine group. Incidentally, it is surprising how much less morphine is necessary in the management of acute coronary occlusion when the reflex is overcome by the use of atropine and theophylline plus the inhalation of oxygen. I do not believe that the importance of these reflex effects is sufficiently appreciated by the medical profession in general. No harm can come from the application of these remedies to patients for whom the diagnosis is uncertain. The great harm arises in not considering the possibility of an interference with the coronary flow.

DR. HAROLD E. B. PARDEE, New York: There are two parts to this paper, both of importance. The first part calls our attention to the frequency of sudden death of patients who have had only minor symptoms referable to the heart. The preliminary symptoms are due to coronary insufficiency, and we must learn to recognize such symptoms as possibly due to serious coronary occlusion. In these patients we must particularly look for three important diagnostic features: arrhythmia, fall of blood pressure and electrocardiographic changes. Pulsus alternans and pericardial friction are also of importance but are unfortunately rare. We should make a special effort to obtain the electrocardiogram in these cases because the record will often give an indication of myocardial abnormality in cases that are otherwise negative. It is important to emphasize in this connection that, when the limb leads are normal, if we take two precordial leads, one from the parasternal position and one just beyond the apex, we shall obtain positive findings in 12 or 13 per cent of additional cases. The second part of the paper, on the experimental work, confirms the importance of a reflex mechanism in producing the sudden death which occurs not only among patients who have had only slight symptoms due to coronary insufficiency but also among those who have had cardiac infarction with severe symptoms. Certain therapeutic recommendations are based on this experimental work. It is most important to give an adequate dose of atropine in these cases. The initial dose should be at least $\frac{1}{15}$ grain (1 mg.) or, better, $\frac{1}{50}$ grain (1.3 mg.) and the effect may be continued by $\frac{1}{100}$ grain (0.4 mg.) every four or six hours. An adequate dose of the xanthines is also important. We should give from 5 to $7\frac{1}{2}$ grains (0.3 to 0.5 Gm.) by mouth or the same dose intravenously, provided it is given slowly. Doses of this size are necessary to produce the definite therapeutic effects that are needed in such cases. I feel that the correlation of clinical observation and experimental work in this paper is an ideal of what medical research should be and that the therapeutic conclusions Dr. LeRoy has drawn from this work deserve strong consideration.

DR. GEORGE V. LEROY, Chicago: I was pleased that Dr. Fenn brought up the question of the role of morphine, because it is a complicated problem that we have not completely worked through, using the technic we have described here. It should be observed, though, that to get the same mortality in dogs anesthetized with pentobarbital sodium as occurred in conscious dogs it was necessary to add a definite amount of morphine. If the dogs received pentobarbital sodium alone the mortality was between 30 and 40 per cent, about half way between that of dogs under surgical ether and conscious dogs. Morphine definitely made the dogs more liable to die and was used deliberately in preparing these animals. The other thing that I think bears repeated emphasis is the fact that myocardial failure, as seen by the classic signs of edema, cyanosis and dyspnea, is a

rather minor feature during the first few days in the majority of patients with myocardial infarctions, especially the patients we talked about with small infarcts. Certainly, in the autopsies of these patients, pulmonary edema and hepatic congestion were the exception rather than the rule. I was pleased to have Dr. Pardee recommend the larger doses of drugs. It is our custom clinically, in the use of atropine to give an additional dose of from $\frac{1}{50}$ to $\frac{1}{45}$ grain intravenously. The patient is then maintained in atropinization by $\frac{1}{100}$ to $\frac{1}{50}$ grain at appropriate intervals. The doses of the xanthines in our practice are about $7\frac{1}{2}$ grains every four to six hours in recent occlusions, which parallels very closely milligrams on a kilogram basis, the amounts we used to achieve the results in the dogs.

SIMILARITIES AND DISTINCTIONS BETWEEN SHOCK AND THE EFFECTS OF HEMORRHAGE

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Clinical similarities between shock and the effects of hemorrhage are so numerous that some authorities have regarded the two as identical. It is believed by many that hemorrhage will produce the complete syndrome of shock—a belief which we formerly supported.¹ We supposed that anoxia in the tissues resulting from the effects of hemorrhage would cause endothelial permeability, hemoconcentration and other features characteristic of shock. Blalock² had reported such results, and these coincide with our belief as published; but attempts to substantiate that belief experimentally produced results which were not anticipated.

We made the simple experiment of withdrawing measured amounts of blood from the femoral veins of an unanesthetized dog (no. 338) weighing 10 Kg., allowing intervals of time for physiologic readjustment of the circulation. Erythrocyte counts and hemoglobin determinations were made (by the photoelectric method) before and at intervals during the experiment. Examinations of the blood, including one of the last sample drawn, revealed progressive dilution.

Successive repetitions of the experiment, greater care being taken to approach the death point gradually, gave similar results. Eight dogs were used in unsuccessful attempts to demonstrate a terminal hemoconcentration as a result of simple hemorrhages. The data are summarized in table 1.

It may be seen that dogs vary in their sensitivity to loss of blood. The loss necessary to cause death within twelve to sixty-seven hours ranged from 5.58 to 9.1 per cent of the body weight, but no relation is apparent between this variation and the duration of the experiments. Postmortem examinations were made immedi-

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Because of lack of space, this article has been abbreviated for publication in THE JOURNAL. The complete article appears in the authors' reprints.

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Read before the joint meeting of the Section on Surgery, General and Abdominal, and the Section on Orthopedic Surgery at the Ninety-Seventh Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Moon, V. H.: Shock and Related Capillary Phenomena, New York: Oxford University Press, 1938, p. 171.

2. Blalock, Alfred: Acute Circulatory Failure as Exemplified by Shock and Hemorrhage, Surg., Gynec. & Obst. 58: 551 (March) 1934; Shock: Further Studies with Particular Reference to the Effects of Hemorrhage, Arch. Surg. 29: 837 (Nov.) 1934.

ately, and the visceral appearances in each instance were those characteristic of hemorrhage. The tissues were ischemic, pale and dry; there was no engorgement of the minute vessels, edema, effusions or petechiae. No parenchymal necroses were found by microscopic examination in any of the tissues. Data on these visceral changes were substantiated in all the subsequent experiments on hemorrhage.

In another series the dogs were anesthetized by an intravenous or an intraperitoneal injection of 0.035 Gm. of amytal per kilogram of body weight in order that a continuous record of the arterial blood pressure after hemorrhage might be made. The dogs were bled in measured amounts at intervals from the femoral artery or vein. The duration of the experiment, from the first bleeding to the death of the animal, ranged from four to thirty-one hours. In the experiments of long duration, several bleedings were done on the preceding day, with the dogs in a normal state. Anesthesia and blood pressure readings were initiated only in the last four to six hours of the experiment. The maximal period of anesthesia in the group was six and five-tenths hours. Data procured under these conditions are shown in table 2.

In all instances the viscera were pale, dry and ischemic; no edema, congestion or petechial hemorrhages were found in any tissue at necropsy. The with-

other investigators and of features developing under experimental conditions. Surprisingly few data are on record concerning physiologic disturbances associated with either shock or hemorrhage, and no detailed comparison of these has been found.

TABLE 2—Effects of Hemorrhage in Dogs Under Amytal Anesthesia

Dog	Weight	Blood Drawn, Percentage	Time, Hours	Hemodilution, Percentage
332	21.8	6.2	4.0	35
354	13.0	3.15	4.5	14*
358	11.8	2.61	6.5	11
360	11.3	2.2	6.5	0*
364	8.2	3.9	24.5	48
365	8.0	3.75	28	60
366	6.7	3.58	24.5	46
367	11.4	5.0	26	40
368	11.8	5.3	25.5	43
369	11.3	5.3	25.5	53
372	11.2	4.74	6	34
373	10.8	4.48	31	32*
375	8.6	3.14	25	55

* Dog 354, temporary hemoconcentration followed by dilution (see text); dog 360, neither concentration nor dilution; dog 373, slight concentration followed by dilution.

SUSCEPTIBILITY TO HEMORRHAGE

A comparison was made between the response to hemorrhage by a dog in shock with the blood pressure at the critical level and that of a dog with the blood pressure at the same level from repeated hemorrhages. A dog weighing 13.6 Kg. was anesthetized with 0.035 Gm. of amytal per kilogram of body weight, and an arterial cannula was connected to a mercuric manometer for a continuous record of the blood pressure. Muscle pulp, 4.5 Gm. per kilogram of body weight, was then introduced into the peritoneal cavity. Nine hours later, when the mean blood pressure had declined to 72 mm. of mercury, the animal died within two hours from three bleedings of 10, 15 and 10 cc. respectively at intervals of thirty minutes.

In contrast, a dog weighing 11.6 Kg. was subjected to five repeated bleedings totaling 370 cc., or 3.2 per cent of the body weight, which reduced the pressure to 70 mm. Subsequently, five withdrawals of 20 cc. each, one of 15 cc. and eight of 10 cc. each at intervals of twenty to thirty minutes caused death. In other words, this dog withstood the loss of 195 cc. of blood during five hours after the blood pressure had been reduced to a critical level by previous hemorrhages. Death occurred thirty minutes after the last withdrawal of 10 cc. Hemodilution was progressive; at no time did the erythro-

TABLE 1.—Effects of Hemorrhages in Unanesthetized Dogs

Dog	Weight *	Blood Drawn, Percentage	Time, Hours	Hemodilution, Percentage
338	19.0	5.9	26	60
339	7.25	8.0	67	81
342	11.3	6.63	23.5	50
343	15.4	5.58	12.5	62
344	12.7	8.14	54	57
345	19.5	7.50	28.5	50
346	10.0	9.1	31.5	77
347	7.9	7.78	32.5	76

* In this and the following tables weights are shown in kilograms and the amount of blood drawn is shown as percentage of the body weight

drawal of a smaller total volume of blood produced death, and the hemodilution was much less than in unanesthetized dogs. This is exemplified in a comparison of dogs 346 and 373 (table 3).

It may be seen from the comparison that a loss of blood amounting to 9.1 per cent of the body weight caused 77 per cent hemodilution and death in thirty-one and one half hours without anesthesia, while half as great a loss of blood caused death in thirty-one hours the last six and one half of which the dog was under amytal anesthesia. The hemodilution was less than half that shown by the unanesthetized dog. The reactions of anesthetized animals were significantly different from those of unanesthetized ones. In 2 instances, after hemorrhages totaling 2.6 per cent and 2.2 per cent of the body weight respectively the blood remained at approximately the same concentration as before bleeding, and in 2 others a slight temporary rise followed by a decline in the concentration occurred.

Significant differences were noted between the behavior of dogs after hemorrhages and that of dogs in a state of shock from the absorption of tissue substance. The former were active and did not appear ill; there was no vomiting, diarrhea or evidence of urinary disturbance. Dogs in shock uncomplicated by narcosis are inactive and manifest each of the features of illness mentioned. These apparent contrasts led us to make further comparisons, both of observations recorded by

TABLE 3—Comparison of Two Dogs

Dog	Weight, Kg.	Blood Drawn, Percentage	Time, Hours	Hemodilution, Percentage
346 (not given anesthetic)	10.0	9.1	31.5	77
373 (given amytal)	10.8	4.48	31.0	32

cyte count of the hemoglobin content rise above the value noted in a previous examination. The results of the experiment are shown in figures 2 and 3.

The foregoing results illustrate an observation frequently made: that a person or an animal in shock may not survive a slight loss of blood which under other conditions would not be serious, and that hemorrhage when present is a contributory factor of highest importance.

LYMPH FLOW, TISSUE FLUID AND FLUID BALANCE

Some fifty years ago Heidenhain³ observed that injections of diverse substances increased the flow of lymph. Other significant features of his report have escaped attention. He noted that the injections caused also a decline in the blood pressure and an increase in

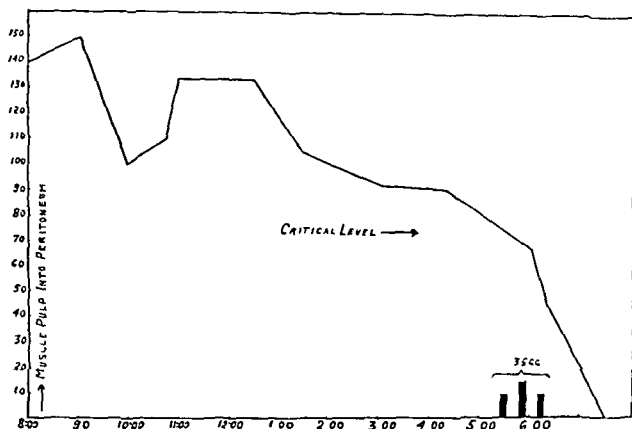


Fig. 2.—Blood pressure during shock. The scale at the left shows arterial pressure in millimeters of mercury. Loss of blood is indicated volumetrically by the height of the shaded columns; clock time is shown at the bottom. After the pressure had declined to 72 mm. three successive bleedings totaling 35 cc. caused death.

the total solids of the blood—hemoconcentration; the period of lowest blood pressure coincided with that of the maximal flow of lymph. Among the substances which produced these results were watery extracts of normal tissues, such as muscle, liver, spleen, kidney and mucosa, and bile, peptone and other secretions.

Subsequent studies (by Starling⁴ and by Drinker and Field⁵) have shown that the increased flow of lymph, its high protein content, the decreased blood pressure and plasma volume and the hemoconcentration result from the leakage of plasma through capillary walls rendered abnormally permeable by the effects of the agents used. It has been shown that Heidenhain's "lymphagogues" and other substances which cause endothelial damage will produce the complete syndrome of shock if given in sufficient doses.

The following experiment illustrates the effect of shock on lymph flow.

A dog weighing 14 Kg. was placed under continuous ether anesthesia, the ether being administered through a tracheal tube, and the thoracic duct was cannulated. The rate of lymph flow was found to average 0.4 cc. per minute during a thirty minute period. The specific gravity of this lymph was 1.016, and it contained 420 cells per cubic millimeter. Seventy Gm. of muscle was excised from the dog's gluteal region, care being taken to avoid loss of blood by hemorrhage. The muscle was finely ground in a meat chopper, suspended in 150 cc. of physiologic solution of sodium chloride and introduced into the same dog's peritoneal cavity. During the ensuing two hours the rate of lymph flow averaged slightly more than 1 cc. per minute—an increase of 150 per cent. The specific gravity had risen to 1.018 and the cell content to 4,080 per cubic millimeter. The lymph became salmon colored, then pink, then finally bright red because of a progressive increase in the content of erythrocytes. Likewise, the coagulability of the lymph increased noticeably, so that it clotted frequently within the cannula, notwithstanding the increased rate of its flow. During four hours the hemoconcentration increased more than 20 per cent.

as was shown by determination of the hemoglobin content and by counts of red cells. Similar changes in the flow and character of the lymph resulted when the experiment was repeated.

The effect of hemorrhage in another experiment performed under comparable conditions showed a striking contrast.

A dog weighing 21.8 Kg. was similarly anesthetized, and cannulation of the thoracic duct gave an average lymph flow of 0.66 cc. per minute during one hour. During the ensuing hour the dog was bled at intervals in amounts totaling 345 cc., 1.6 per cent of the body weight, or about 22 per cent of the estimated blood volume. During the next two hours the rate of lymph flow was only 0.21 cc. per minute—a decrease of 68 per cent. The lymph became lighter in color and did not coagulate spontaneously.

This substantial reduction in the flow of lymph and change in its composition are diametrically opposite to the change which accompanies shock. These results coincide with the observation of Starling that the formation and flow of lymph are decreased after hemorrhages.

The water content of various tissues was determined by weighing accurately the fresh, finely minced substance, desiccating it completely and weighing the residue to determine the water loss. Care was exercised in taking the specimen from the same area, e. g. the muscle or bowel, in each instance. Lung was not included in this comparison because the fluid content of the lobes varies and it was found technically difficult to desiccate the entire organ.

It was found that the skeletal muscles, liver and bowel wall contained more water after shock than after death by hemorrhages. Other investigators have recorded that these tissues become dehydrated after hemorrhages. Differences in the water content of the kidneys and pancreas were insignificant. An increase in tissue fluid was emphasized by Eppinger⁶ as a regular occurrence in shock from trauma and from other causes. The fluid had a high protein content, and its chemical composition closely approximated that of plasma.

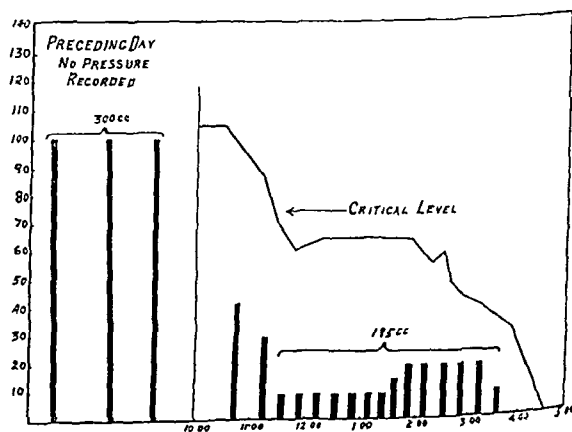


Fig. 3.—Blood pressure after hemorrhage. Three bleedings, producing 100 cc. of blood each, were done on the preceding day. After aural anesthesia had been done the withdrawal of 70 cc. of blood brought the arterial pressure to 70 mm. A further loss of 195 cc. of blood, drawn in fourteen successive bleedings, was required to cause death.

Blalock reported the production of edema by hemorrhages, but we have not found confirmation of this in the observations of others. Physiologists agree in stating that hemorrhage is followed immediately by a

3. Heidenhain, R.: *Versuche und Fragen zur Lehre von der Lymphbildung*. Arch. f. d. ges. Physiol. 49: 209, 1891.

4. Starling, E. H.: *Principles of Human Physiology*. Philadelphia, Lea & Febiger, 1936, p. 837.

5. Drinker, C. K., and Field, M. E.: *Lymphatics, Lymph and Tissue Fluid*. Baltimore, Williams & Wilkins Company, 1933.

6. Eppinger, Hans; Kaunitz, Hans, and Popper, Hans: *Die Entzündung*. Berlin, Julius Springer, 1935.

transfer of fluid from the tissues to the blood. By this physiologic means for counteracting the effects of hemorrhage the lost blood volume is restored, but the water content of the tissues is reduced correspondingly. At necropsy the tissues are described regularly as ischemic and dry when uncomplicated hemorrhages have caused death.

A serious derangement of fluid balance is evidenced by the increased flow of lymph, the increase in tissue fluid, the hemoconcentration and the disturbance of absorption which accompanies shock. This derangement apparently has escaped the attention of most authors, for we have seen no discussion of it in the voluminous literature pertaining to the dynamics of shock. Several physiologic forces participate in maintaining normal relations between intravascular and extravascular fluids. But the action of these forces depends primarily and essentially on the presence of a semipermeable membrane between those fluids. Abnormal permeability of the endothelium throws out of gear the entire mechanism of fluid balance. The disturbance develops simultaneously with circulatory deficiency resulting from capillary injury, and it interrupts the process of absorption. Failure to absorb fluid from the tissues and from the gastrointestinal tract results in hemoconcentration—a characteristic sign of shock. Furthermore, the loss of fluid by vomiting, perspiration and diarrhea is not compensated readily. Fluids given intravenously leak out into the tissues, accentuating the edema without relieving the hemoconcentration.

Patients or animals affected by simple hemorrhages will absorb fluids from the tissues and from the gastrointestinal tract, thus restoring the blood volume. Suitable fluids given intravenously will be retained, because endothelial permeability has not been increased and the mechanism of fluid balance is not notably impaired.

COAGULABILITY

All the recorded observations we have found indicate that the coagulation time is appreciably lengthened during shock. This has been noted after burns, peptone poisoning, anaphylaxis and injections of histamine, as well as in the case of traumatic and experimental shock. Popielski⁷ emphasized this feature and cited an instance in which blood from an animal in shock remained unclotted for sixty-four hours. Howell⁸ commented on the low coagulability of the blood in anaphylaxis and after injections of protein cleavage products, peptone and histamine. He explained this as due to excessive mobilization of heparin from the liver. Perhaps the explanation applies also to delayed clotting in shock from other causes. We found the speed of coagulation noticeably retarded in 10 of 12 dogs tested during shock. One animal showed more rapid coagulation, and 1 showed no significant change.

After hemorrhages the formation of fibrin is accelerated and the clotting time is shortened.⁹ The acceleration is detectable within ten minutes after the hemorrhage.¹⁰ In our experiments, the blood of dogs clotted normally in eight to twelve minutes. After each successive bleeding the coagulation was more

rapid, and when the blood pressure had declined to the critical level the blood clotted completely in one to four minutes. A decided increase in the speed of coagulation occurred after hemorrhages in 9 of 10 dogs on which observations were made. In 1 dog no significant change occurred.

BLOOD CHEMISTRY

An increase in the nonprotein nitrogen content of the blood during shock was first reported by Duval and Grigaut¹¹ (1918). This was confirmed by Aub and Wu and by others. Whipple and Van Slyke¹² found that the increase consisted largely of urea, amino and peptid nitrogen. Other investigators have shown that the creatinine content is also increased. These changes occur with traumatic shock, burns, intestinal obstruction and anaphylaxis and after injections of commercial peptone and of histamine. Lurje¹³ found an increased nonprotein nitrogen content in the blood during shock after surgical operations in 8 patients. The level returned to normal when the circulatory deficiency was relieved. Whipple attributed the rapid piling up of nitrogen in the blood to a rapid breakdown of protein substances and to retarded renal elimination. It is recalled that severe disturbance of renal function, indicated by oliguria and by albumin, bile, debris, casts and erythrocytes in the urine, frequently accompanies shock (Eppinger⁶).

An increase in the hydrogen ion concentration and a decrease in the carbon dioxide-combining power of the plasma have long been recognized as regular features. These were considered etiologic until the results of experimentation showed them to be effects rather than causes.

Hypochloremia, chiefly a diminution of the level of sodium chloride, has been shown to accompany the increased nonprotein nitrogen content and decreased alkaline reserve mentioned previously. Scudder¹⁴ has shown that the blood sodium content is decreased in shock from various causes. His summary on changes in the blood indicated also that the potassium, calcium and magnesium contents are increased and that the amount of phosphates is decreased.

Isolated reports have indicated that the alkaline reserve is decreased and the chloride levels increased after hemorrhages. Scudder's data indicated that the blood potassium level is elevated during the moribund state resulting from loss of blood. Leichsenring and Biester's¹⁵ studies on the effects of hemorrhages in dogs showed a decrease in the nonprotein nitrogen level on the first day after the hemorrhages in eight of ten tests and a slight increase in two tests. They said: "The nonprotein nitrogen level per unit volume was slightly below normal during the postbleeding period." They cited reports of somewhat variable results by other workers and regarded the changes in the nonprotein nitrogen level after the loss of blood as transitory.

We undertook a comparison of the chemical and other hematologic changes which occur during shock and after hemorrhages. In the earlier tests, data on the

7. Popielski, L.: Ueber die physiologische Wirkung von Extrakten aus sämtlichen Teilen des Verdauungskanales, *Arch. f. d. ges. Physiol.* 128: 191, 1909.

8. Howell, W. H.: Address: Recent Advances in the Problem of Blood Coagulation Applicable to Medicine, *J. A. M. A.* 117: 1059 (Sept. 27) 1941.

9. Best, C. H., and Taylor, N. B.: *Physiological Basis of Medical Practice*, Baltimore, Williams and Wilkins Company, 1939, p. 36.

10. Castle, W. B., and Minot, G. R.: *Pathologic Physiology and Clinical Description of the Anemias*, New York, Oxford University Press, 1936, p. 36.

11. Duval, P., and Grigaut, A.: La rétention azotée des blees, *Compt. rend. Soc. de biol.* 81: 873, 1918.

12. Whipple, G. H., and Van Slyke, D. D.: Proteose Intoxication and Body Protein, *J. Exper. Med.* 28: 213 (Aug.) 1918.

13. Lurje, A.: Protein Metabolic Disturbances Under Conditions of Shock and Surgical Interference, *Am. J. Surg.* 32: 313 (May) 1936.

14. Scudder, J.: Shock: Blood Studies as a Guide to Therapy, Philadelphia, J. B. Lippincott Company, 1940.

15. Leichsenring, Jane M., and Biester, Alice: The Blood Picture in Hemorrhagic Anemia, Technical Bulletin 139, University of Minnesota, Agricultural Experiment Station, 1939.

blood of dogs at or immediately before death were compared with data on the same dogs before the experiments. Then it was realized that values derived from moribund animals are not so reliable and may show variations not present before the animals were in a dying condition. In order to obviate this source of error in subsequent experiments, blood was drawn for examination when hemoconcentration or hemodilution indicated that the circulation was seriously affected by shock or by hemorrhage respectively. When a continuous record of the blood pressure was made, blood for chemical tests was drawn when the pressure had declined to a critical level of 70 mm. of mercury. In

A comparison of these data indicates that hemoconcentration, as shown by erythrocyte counts and hemoglobin and specific gravity readings, occurred regularly during shock and that hemodilution resulted after bleedings.

There was a noticeable increase in the nonprotein nitrogen content during shock in each instance; a moderate decrease was found in 4 of 6 dogs after hemorrhages. In 2 there was a slight increase.

The chloride content of the plasma declined moderately in 5 of 7 dogs during shock; in 2 there was no significant change. The level of chlorides increased in 5 of 6 dogs as a result of bleedings.

TABLE 5.—Changes in the Blood During Shock

		Dog 371	Dog 374	Dog 376	Dog 378	Dog 379	Dog 380	Dog 384
Cause of shock.....		Muscle pulp	Muscle pulp	Muscle pulp	Hista- mine	Anaphy- laxis	Hista- mine	Muscle pulp
Erythrocytes, millions.....	Before	4.86	5.76	5.78	5.94	6.33	6.92	6.0
	After	6.01	6.43	6.32	7.26	8.17	8.82	7.62
Hemoglobin, Gm.	Before	10.37	14.74	12.8	11.1	13.44	14.64	11.1
	After	11.9	16.00	16.2	12.84	16.56	16.56	15.1
Specific gravity.....	Before	1.049	1.034	1.060	1.030	1.037	1.030	1.012
	After	1.065	1.070	1.068	1.054	1.061	1.058	1.038
Nonprotein nitrogen.....	Before	21.6	32.85	32.13	23.0	14.2	21.84	17.13
	After	43.2	40.0	63.26	56.0	18.46	67.86	34.72
Chlorides.....	Before	369	389	390	362	360	377	370
	After	371	379	379	337	355	343	371
Serum protein.....	Before	8.44	5.4	5.42	5.85	8.53	5.0	5.57
	After	7.04	4.7	4.62	4.92	4.20	3.99	3.69
Blood sugar.....	Before	82.5	146.0	128.75	116.0	127.63	119.52	113.16
	After	283.8	127.0	108.68	225.0	142.5	209.28	71.34
Carbon dioxide, volume per cent.....	Before	43.67	46.11	56.86	50.6	47.5	55.6	63.87
	After	41.77	39.52	13.76	30.78	40.78	37.2	47.26

TABLE 6.—Changes in the Blood After Hemorrhage

		Dog 372*	Dog 373*	Dog 375*	Dog 377	Dog 382	Dog 383
Percentage of body weight bled.....		4.78	4.48	3.14	5.6	5.1	6.8
Time.....		6 hrs.	31 hrs.	25 hrs.	8 hrs.	22 hrs.	26 hrs.
Erythrocytes, millions.....	Before	5.500	5.380	5.410	5.270	5.670	6.190
	After	2.360	2.790	1.990	1.090	2.050	2.170
Hemoglobin, Gm.	Before	13.0	14.03	14.07	13.56	10.40	11.6
	After	8.54	9.57	6.40	6.75	4.80	4.8
Specific gravity.....	Before	1.050	1.025	1.051	1.044	1.038	1.044
	After	1.037	1.018	1.026	1.027	1.018	1.024
Nonprotein nitrogen.....	Before	28.6	30.68	25.00	18.50	25.5	31.5
	After	21.1	31.75	20.70	30.7	18.9	23.63
Chlorides.....	Before	358	374	391	386	360	374
	After	326	414	416	405	378	350
Serum protein.....	Before	5.53	4.38	4.60	5.06	5.06	4.68
	After	4.3	3.44	3.65	4.10	3.91	3.89
Blood sugar.....	Before	140	141	143.5	120.00	123.1	104.4
	After	189	184	167.5	646.75	243.6	393.3
Carbon dioxide, volume per cent.....	Before	50.83	43.80	62.01	51.36	52.4	63.0
	After	51.77	34.48	43.53	36.63	50.4	30.25

* Dogs 372, 373 and 375 were under amytal anesthesia during part of the experiment.

4 dogs shock was induced by absorption of muscle pulp from the peritoneal cavity, in 2 by repeated subcutaneous injections of histamine and in 1 by anaphylaxis (from horse serum). The data from these comparisons are shown in tables 5 and 6.¹⁶

16. Chemical determinations of the blood or blood serum were made according to the following methods: the Koch and McMeekin for non-protein nitrogen, the Folin and Wu for sugar, the Whitehorn for chlorides, the Peters and Van Slyke for carbon dioxide content and the Looney and Walsh for total protein. Descriptions of these methods may be found in:

- Koch, F. C., and McMeekin, T. L.: A New Direct Nesslerization Micro-Kjeldahl Method and a Modification of the Nessler-Folin Reagent for Ammonia, *J. Am. Chem. Soc.* **46**: 2066 (Sept. 5) 1924.
Folin, O., and Wu, H.: A System of Blood Analysis: I. A Simplified and Improved Method for Determination of Sugar, *J. Biol. Chem.* **41**: 367, 1920.
Whitehorn, J. C.: Simplified Method for Determination of Chlorides in Blood or Plasma (Supplement to Folin's System of Blood Analysis), *J. Biol. Chem.* **45**: 449, 1921.
Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, 1932, vol. 2, pp. 245-251.
Looney, J. M., and Walsh, A. I.: The Determination of Globulin and Albumin in Blood Serum by the Photoelectric Colorimeter, *J. Biol. Chem.* **130**: 635 (Oct.) 1939.

There was an appreciable decline in the content of serum proteins per hundred cubic centimeters and in the carbon dioxide content of the plasma both in shock and after hemorrhage. The blood sugar content varied irregularly during shock, but a considerable increase occurred regularly after hemorrhage. Hence total proteins, blood sugar and reserve alkalinity are not points of distinction between shock and hemorrhage.

COMMENT

Several workers¹⁷ reduced the blood pressure of dogs below 70 mm. of mercury by the repeated withdrawal of blood from the femoral artery. When the arterial pressure sank, blood was introduced by direct transfusion;

17. Blalock, Alfred: Principles of Surgical Care, Shock and Other Problems, St. Louis, C. V. Mosby Company, 1940.
Freeman, N. E.; Shaffer, S. A.; Schechter, A. E., and Holling, H. E.: The Effect of Total Sympathectomy on the Occurrence of Shock from Hemorrhage, *J. Clin. Investigation* **17**: 359 (May) 1938.

when it rose above 70 mm., a quantity of blood was again removed. By this combination of removal and reintroduction of blood, the pressure was maintained at about 70 mm. for several hours. The animals showed a number of the clinical features of shock: weakness, pallor, thready pulse and low blood pressure. Hemo-

TABLE 7.—Items Identical in the Two Conditions

Sympathoadrenal activity
Stimulation of myocardium
*Strong, rapid pulse in early stages
*Peripheral vasoconstriction
Reduced volume flow
*Peripheral ischemia, pallor
*Loss of tissue turgor
Discharge of reservoir blood into systemic circulation
*Contraction of spleen
*Increased blood sugar content
*Dilatation of pupils, often perspiration
Low basal metabolism
*Declining temperature
*Decreased alkaline reserve
*Decreased serum protein content
*Increased respiratory rate, thirst
*Low arterial blood pressure (in late stages)
*Death due to inadequate circulatory function

concentration was observed in all such experiments. "Particularly impressive is the finding that all animals died despite the fact that more blood was introduced than had been removed." In other words, transfusion was without benefit after low blood pressure had existed for an extended period. Examination of the tissues after death showed visceral congestion, edema and petechial hemorrhages. "These observations prove that shock can be produced by uncomplicated hemorrhage and that hemoconcentration, a negative response to transfusion and alterations in the tissues result if the circulation remains depressed for several hours."

Before accepting these deductions in toto, one should examine thoughtfully the conditions of the experiments. It is known that neither man nor animals can survive when the arterial pressure is maintained, by whatever means, below the "critical level," i. e. 70 to 80 mm. of mercury.

Certainly when the blood pressure is maintained at 70 mm. continuously by hemorrhage or by any other means a point will be reached after which neither transfusion nor any other procedure will restore circulatory efficiency. Animals so treated inevitably die. When an animal is dying from any cause there is relaxation of vascular tonus affecting particularly the capillaries and venules. Anoxia, which regularly accompanies the moribund state, causes abnormal permeability of the endothelium. If at this stage a quantity of blood is introduced it will distend the atonic vessels and will produce visceral congestion. If death does not occur immediately, leakage of plasma will cause both edema and hemoconcentration.

If transfusions of blood were given to a dog moribund from some natural cause, such as neoplasm, infection with worms or nephritis, the same results would be expected to follow. Would the negative response to transfusions, unremitting decline in blood pressure, visceral congestion, edema and hemoconcentration indicate that neoplasm or other disease caused shock?

Other readers may interpret such results as the artificial production of the features mentioned and as a demonstration that vascular atony and endothelial permeability occur whenever an animal is moribund.

We have been unable to demonstrate hemoconcentration and the visceral pathologic changes of shock in animals brought to death by repeated losses of blood.

Nevertheless, we believe that capillary atony and endothelial permeability develop as terminal events when an animal is moribund from hemorrhages or from any other cause. These changes are accompanied by a grave derangement of fluid balance.

A highly important difference between shock and the effects of hemorrhages, as we see it, is that endothelial injury and the resulting disturbances of circulation and of fluid balance occur as initial derangements causing shock, while the same disturbances develop only in the terminal or moribund state after hemorrhages.

SUMMARY

Several features in the syndrome of shock occur also after hemorrhage because the two evoke the same physiologic mechanism for counteracting the disturbance. The points of resemblance are arranged in table 7. The items which we have verified experimentally are marked with an asterisk.

Incipient circulatory deficiency from shock, hemorrhage or other causes evokes compensatory reactions by the sympathoadrenal system resulting in identical responses. Hence no distinctions from the effects of hemorrhage were evident, and the two conditions were regarded as identical.

We have assembled the various physiologic and biochemical features which have been reported in cases of shock from wounds, burns, intestinal obstruction, anaphylaxis and other causes and reports on the same items as observed after uncomplicated hemorrhage.

TABLE 8.—Comparison of Results of Hemorrhage and Shock

Items	Shock	Hemorrhage
*Endothelium.....	Permeable to colloids	Impermeable to colloids
*Flow of lymph.....	Increased	Decreased
*Tissue fluid.....	Increased	Decreased
*Fluid balance.....	Disturbed	Undisturbed
*Pulmonary edema.....	Frequent	Absent
*Absorption from gastrointestinal tract	Impaired	Unimpaired
*Absorption from tissues....	Impaired	Unimpaired
*Vomiting.....	Persistent	No vomiting
*Diarrhea.....	Frequent	Absent
*Effect of moderate loss of blood	Severe	Mild
Transfusion of blood.....	Often ineffective	Effective
*Saline solution, administered intravenously	Ineffective	Often effective
*Urine.....	Concentrated, low volume; contains albumin, erythrocytes, bile and debris	No characteristic changes
Blood		
*Coagulation time.....	Lengthened	Shortened
*Hemoglobin content, erythrocyte count	Increased	Decreased
*Specific gravity.....	Increased	Decreased
*Nonprotein nitrogen level..	Increased	Decreased
Potassium content.....	Increased	Terminal increase
Calcium content.....	Increased	Decreased
Magnesium content.....	Increased	Decreased
*Chloride content.....	Decreased	Increased
Changes Seen at Necropsy		
*Edema of soft tissues.....	Characteristic	None
*Serous effusions.....	Present	Absent
*Capillovenous congestion..	Characteristic	Absent
*Petechiae.....	Characteristic	Absent
*Visceral ischemia.....	Absent	Present
Weight of organs.....	Increased	Decreased
*Gastrointestinal tract.....	Dilated, atonic	Contracted
*Parenchymal necroses.....	Present	Absent

These have been arranged in table 8 to facilitate comparison. We have verified experimentally the items marked with an asterisk.

Medical history records instances in which a symptom complex, once regarded as a disease entity, later has been shown to comprise several more or less unrelated conditions. The terms leprosy and Hodgkin's disease originally were applied to groups of conditions

having clinical resemblances but later shown not to be identical. Few terms have been used more loosely and indefinitely than shock. Hence it is not strange that the effects of hemorrhage, which clinically resemble shock so closely, should have been included without discrimination in the broad application of that term.

It is remarkable that numerous important differences so long have escaped the attention of persons interested in these conditions. We humbly admit our own error in subscribing for a time to the belief that uncomplicated hemorrhage will produce the syndrome of shock.

Since this article was written, Price¹⁸ and his associates have published the effects of simple hemorrhages as observed in 37 dogs. Their results confirm those which we have recorded. The interval between the first bleeding and the death of the animals ranged between five and six hours. Hemodilution occurred regularly; the clotting time was reduced; the plasma chlorides and sodium increased; the potassium and the nonprotein nitrogen of the blood rose shortly before death. Necropsy showed pallor of the tissues and organs. No edema nor increased wetness of the tissues, no abnormal fluid in serous cavities, no visceral congestion nor evidence of increased capillary permeability was seen. They concluded that "Evidence is presented to show that capillary atony, 'stasis' and abnormal permeability of capillaries probably do not occur in dogs following uncomplicated acute hemorrhage."

CONCLUSIONS

Points of similarity between shock and the effects of hemorrhage result in part from the fact that each evokes the same mechanism of compensation and in part from the deficiency of circulation which each produces.

Points of contrast between shock and the effects of hemorrhage are so numerous that the assumed identity of those conditions is no longer tenable.

Hemorrhage when present is a highly important contributory factor because the derangement of fluid balance which accompanies shock interrupts the processes by which loss of blood is compensated.

For the sake of accuracy the expression shock and hemorrhage should be substituted for the term hemorrhagic shock.

We urge investigators not to employ hemorrhage as a means for producing shock experimentally. If the results so obtained are interpreted as applying to shock, erroneous conclusions may be drawn.

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ABSTRACT OF DISCUSSION

DR. HENRY H. HARKINS, Detroit: Dr. Moon and I represent almost opposite extremes of belief concerning the mechanism of shock, especially concerning the particular aspect that Dr. Moon and his co-workers have presented today. One of the differences between our views is: Are hemorrhage and shock the same? At no time have I stated that hemorrhage is the same as shock, but I do believe that hemorrhage will lead to shock. Dr. Moon states that transfusions are effective in hemorrhage but not in shock. My work and that of Dr. Blalock and others have led to a contrary conclusion, namely that, if the hemorrhage is allowed to continue long enough, the restitution of even more blood than was removed will not restore the animal or patient. I am sure all of you have had experience with instances of severe bleeding that come in late and where large blood transfusions are given (probably larger than the amount of blood that was lost) and yet the patient does not recover. In the authors' chart where they discussed 26 dogs

with protracted hemorrhage so that the dogs did not die for a long period, I should like to know whether or not he had blood pressure readings. Several authors have found that pathologically the changes in protracted hemorrhage are much the same as in protracted shock. However, it is essential that the blood pressure remain low for several hours if hemorrhage is to cause these pathologic changes. In such cases the pathologic changes at autopsy will be much the same whether the shock was produced by hemorrhage or by other injury, as shown by Blalock of Johns Hopkins, the late Mr. O'Shaughnessy of London, and more recently by Dunphy, Gibson and Keeley. From the practical point of view, especially when we are approaching war, it should be pointed out that, even if shock produced by other means differs somewhat from shock produced by hemorrhage, too much importance should not be attributed to this from the point of view of treatment. Since we do not know about some of the obscure manifestations of shock and our chief means of treatment is to give fluid replacement, whether the fluid lost is whole blood or plasma, the most important item is to restore it as quickly as possible. If a patient has hemorrhage plus other types of shock there may not be hemoconcentration. Some of my recent work not yet completed has shown that in shock a great deal of fluid is lost remote from the site of injury, in agreement with the work of Moon and his collaborators.

THE SURGICAL TREATMENT OF PROSTATIC DISEASE

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NEW YORK

Surgical diseases of the prostate gland present so many variations that no one surgical procedure will obtain the best results in all cases. A thorough understanding of the site of origin and progression of the disease permits one to select the proper surgical approach in each instance. So commonly do surgeons refer to the various types of prostatic operations as "removal of the prostate" that many forget that the prostate is rarely actually removed. In many instances only the hyperplastic tissue, or so-called adenoma, is removed; the functioning prostatic glands or their remnants remain firmly attached to the surrounding fascia and together are referred to as the false capsule of the prostate. Often removal of this hyperplastic tissue is all that is required to establish adequate drainage of the bladder, and the remaining compressed, uninvolved prostatic tissue may reasonably be left behind. It is not uncommon, however, for these remaining prostatic glands or their remnants to be the seat of a pathologic process which also requires removal for the patient to be cured.

ETIOLOGY

There is evidence that hyperplasia (adenoma) of the prostate in advancing years is incited by an imbalance of male and female hormones. As yet, however, there is no pathologic evidence that hormonal therapy will inhibit or stop this process once it has begun.

Just which elements in the prostate give rise to prostatic hyperplasia has been a much discussed subject for years, although observers have agreed that the new growth makes its first appearance near the urethra and just under the mucosa. Tandler and Zuckerkandl,¹

Read before the Section on Urology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

The expenses of this research were defrayed from the Alfred P. Sloan Research Fund of the Foundation of the

1. Tandler and Zuckerkandl, *Prostatahypertrophie*, D. M.: Practice 1926, vol. 1, chapter 7.

18. Price, P. B.; Hanlon, C. R.; Longmire, W. P., and Metcalf, William: Effects of Acute Hemorrhage in Healthy Dogs, *Bull. Johns Hopkins Hosp.* 69: 327 (Oct.) 1941.

ur. Anatomie und Klinik der Prostatahypertrophie, Young, H. H., and Davis, W. B. Saunders Company.

among others, expressed the belief that prostatic hyperplasia develops from the short prostatic glands which extend only a short distance beneath the mucosa in the prostatic portion of the urethra (fig. 1). This is the locality where hyperplastic changes are first seen in the prostate. Deming and Wolf,² in a recent study of 210 prostates, agreed with these authors regarding the location of the new growth but claimed that hyperplasia does not arise directly from these short prostatic glands, being first seen as a fibromuscular mass in the muscular wall of the prostatic portion of the urethra. Deming³ suggested that this mass may correspond to uterine myoma, since theoretically the two growths have a common embryologic anlage. The fibromuscular masses lie parallel to the muscular fibers of the urethra between the prostatic ducts and stimulate epithelial hyperplasia from these ducts of the prostatic glands (fig. 2). Deming and Wolf stated that this hyperplasia is not an enlargement of existing prostatic glands but, although similar in structure, is composed of newly formed glandular elements from the ducts of the prostatic glands. This explains its locality surrounding the prostatic urethra, from which the growth extends to compress the true lateral and posterior lobes toward the capsule and hence assumes the position of the lateral lobes on each side of the urethra (figs. 3 and 4).

Hyperplasia of the prostate may occur just under the urethral mucosa in the region of the lateral lobes, the median commissural lobe, the subcervical lobes or the subtrigonal lobes (fig. 5). However, it does not occur in the posterior lobe of the prostate, nor does it originate in the functioning glands of the lateral or median prostatic lobes. As the hyperplasia in the region of the lateral lobes increases in size, the prostatic portion of the urethra is distorted with an anteroposterior elongation (figs. 3 and 4). Eventually the urethra is so compressed as to cause urinary retention.

Since the ducts of the prostatic glands are involved in this hyperplasia, the drainage from these glands into the prostatic portion of the urethra is gradually obstructed. If the glands are infected, a walled-off focus of infection may remain in the compressed remnants of the prostate gland.

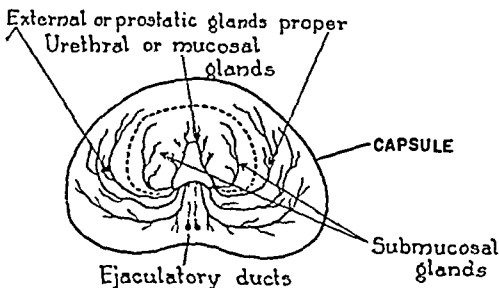


Fig. 1.—Prostatic hyperplasia develops near the urethra, as shown diagrammatically by the encircled dotted line. The external glands, or prostatic glands proper, are compressed toward the capsule as the hyperplastic mass increases in size. The posterior lobe is not shown but is in the region marked "ejaculatory ducts."

PROSTATIC CALCULI

The entire prostate undergoes a change at the age of about 50. R. A. Moore⁴ has shown how poor drainage from the prostatic glands predisposes to the

formation of a nucleus of desquamated epithelium and debris to form corpora amylacea. These foreign bodies are formed in the functioning prostatic glands in contradistinction to the hyperplasia, which develops near the urethra from the gland ducts. The corpora amylacea are frequently surrounded by round cell infiltration and

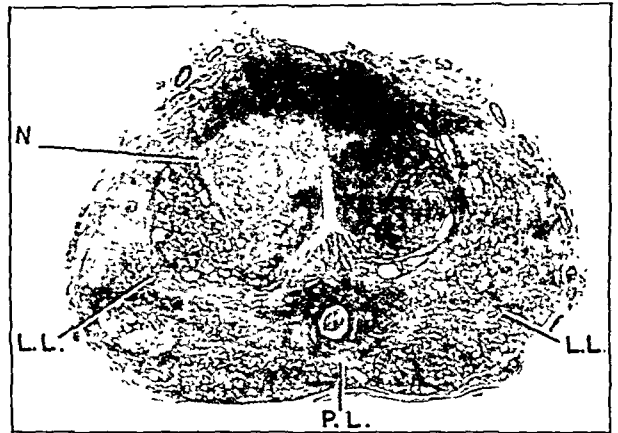


Fig. 2.—Cross section ($\times 2$) of prostate of a man aged 74 showing nodule (N) one half of which is glandular and the other half aglandular. Note fibromuscular masses on each side of the urethra being invaded by epithelial hyperplasia from the ducts of the prostatic gland. Note beginning compression of the lateral lobes (L. L.) by this mass and the uninvolved posterior lobe (P. L.). (From Deming.)

fibrosis in the prostatic gland itself. Calcium salts may be deposited around these nuclei to form prostatic calculi.

Corpora amylacea, or prostatic calculi, often surrounded by evidence of infection, may be present for years without causing any symptoms. In some patients, however, a severe infection develops and symptoms are produced that require surgical intervention. In other patients hyperplasia (adenoma) may develop in the region of the ducts near the urethra. As this increases in size the corpora amylacea, infection and calculi if present are compressed toward the capsule with the prostatic glands; the ducts from the prostatic glands are gradually occluded, and the infected prostatic remnants may no longer drain into the urethra. Some glands become atrophic, while in others infection or calculi may be walled off by the enlarging hyperplasia (fig. 6).

CARCINOMA

Carcinoma of the prostate is said to originate in the posterior lobe in about 75 per cent of cases. Recent statistics by Moore⁵ and Rich⁶ drew attention to the fact that between 14 and 16 per cent of all men over 50 have prostatic carcinoma. Although these percentages seem rather high, carcinoma of the prostate either is becoming more common or is being recognized more frequently. In treating prostatic disease one cannot overlook these observations without giving serious thought to rational treatment. Since the average life expectancy of men has increased, it may be that one should expect to find prostatic malignant neoplasms more frequently.

DIAGNOSIS

The exact nature and extent of prostatic disease should be determined before the type of surgical procedure to be employed is decided on. Frequent urina-

2. Deming, C. L., and Wolf, J. S.: The Anatomical Origin of Benign Prostatic Enlargement, *J. Urol.* 42: 566-580 (Oct.) 1939.

3. Deming, C. L.: The Development of Prostatic Hyperplasias, *Surg., Gynec. & Obst.* 70: 588-594 (Feb.) 1940.

4. Moore, R. A.: Morphology of Prostatic Corpora Amylacea and Calculi, *Arch. Path.* 22: 24-40 (July) 1936.

5. Moore, R. A.: Evolution and Involution of Prostate Gland, *Am. J. Path.* 12: 599-624 (Sept.) 1936.

6. Rich, A. R.: On the Frequency of Occurrence of Occult Carcinoma of the Prostate, *J. Urol.* 33: 215 (March) 1935.

tion and the finding of residual urine in the bladder and of an enlarged prostate by rectal examination are not sufficient evidence to suggest the employment of a particular type of surgical procedure. Rectal examination, though valuable, may be misleading in the diagnosis of the presence or the extent of prostatic disease in almost 50 per cent of cases.⁷ It is not uncommon

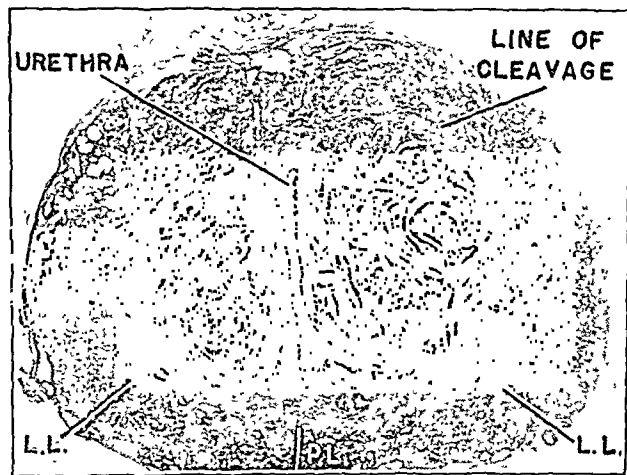


Fig. 3.—Cross section (under low power) of an entire prostate gland, showing multiple adenoma in neighborhood of urethra. Periphery shows nonadenomatous prostatic tissue. Note the replacement of the fibromuscular mass by hyperplasia, which is assuming the position of the lateral lobes. The lateral and posterior lobes are further compressed and are becoming functionless. Between the hyperplasia and the compressed lateral lobes is the "line of cleavage" where "enucleation" of the prostate by suprapubic or transurethral prostatectomy is performed, the remnants of prostate left behind being called the false capsule. (From Geraghty.)

to have a patient who has been referred by a physician state that rectal examination has ruled out prostatic disease, only to find that the prostate is actually the source of his symptoms. Hyperplasia of the subcervical or subtrigonal lobes or of the median commissural lobe and the presence of fibrous bars at the vesical outlet are among the conditions which may cause no change in the contour or size of the prostate as revealed by rectal palpation yet may require surgical intervention for their relief.

The exact location and extent of the obstruction should be established. The presence of prostatic infection, fibrosis or calculi should be determined. Cystoscopic examination when indicated will aid the urologist in selecting the type of operation in many instances. The presence of a hard nodule in the prostate determined by rectal palpation is suggestive of a malignant neoplasm, and the nodule should be treated as such until proved otherwise.⁸ Considerable information concerning the size and extent of the prostatic obstruction may be obtained by an aerogram and cystourethrogram, with the patient in a semilateral position. In most instances the procedure may be performed with little discomfort to the patient.⁹

TREATMENT

When the exact diagnosis of the type of prostatic disease has been established, one must decide on the surgical procedure which will relieve the patient promptly and permanently. The origin and location of the disease and its underlying pathologic changes

should be considered, since a clear understanding of the progression of the disease is often the deciding factor between one approach and another. To attempt to remove a fibrous prostate, particularly if calculi are present, by suprapubic prostatectomy reveals poor surgical judgment. One cannot remove the posterior lobe of a prostate containing an early malignant neoplasm by suprapubic prostatic enucleation.

The particular method used for removal of the prostate has, in the past, depended to a large degree on the choice of the surgeon, who has considered only his training and ability to relieve the obstruction. In some instances he has overlooked the underlying pathologic condition and has not selected the operation most likely to give the patient complete and permanent relief from his prostatic disease. In other words, the surgical procedure employed should depend, not on the surgeon's skill with any one method, but on the nature of the pathologic process in the prostate.¹⁰

It is essential that renal damage, infection and hemorrhage and retention of urine be considered in the treatment of all patients with prostatic disease. These conditions have been thoroughly discussed in the literature. One finds statistics showing a low mortality for each type of surgical approach to the prostate, and one is aware that the low mortality is the result of the proper preparation of patients by a surgeon who is highly skilled in the surgical approach he advocates. With the same patients and a surgeon skilled in a different surgical approach to the prostate, a similar mortality would probably result.

In some patients who have had a suprapubic enucleation of the prostate or a transurethral resection, a postoperative morbidity persists, with infected urine and frequent urination. These symptoms are distressing both to the surgeon and to the patient. Sometimes they result from infection in the remnants of the prostatic tissue or the seminal vesicles and might have been prevented by removal through the perineum of the prostatic capsule and prostatic remnants together with the hyperplasia.

Transurethral removal of obstructing hyperplastic tissue from the prostate is a rational procedure and has assumed an important place in prostatic surgery. With proper selection of cases and a skilled surgeon, excellent results can be obtained. Opinions vary as to the size of the prostate which is best treated by transurethral operation. However, with a surgeon properly skilled in this procedure, relatively large hyperplastic masses may be adequately removed. Some surgeons prefer to remove large intravesical prostatic hyperplastic masses suprapubically, and similar results may be obtained with these growths by either method.

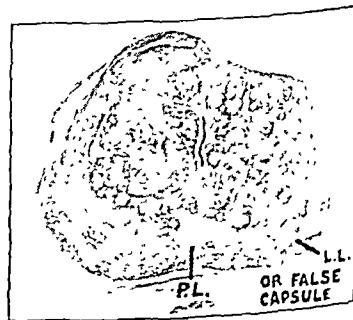


Fig. 4.—Cross section of prostate removed by subtotal perineal prostatectomy. Note progression of hyperplasia and further compression of functioning prostatic glands, which now have become the false capsule. Enucleation would not remove these prostatic remnants. The line of cleavage between the hyperplasia and the compressed prostatic remnants is clearly visualized.

7. Henline, R. B.: Prostatic Disease: Determination of Method of Treatment, *New York State J. Med.*, 38: 773-787 (May 15) 1938 Young and Davis.

8. Hinman, Frank: The Perennial Dispute in the Treatment of Prostatism, *J. A. M. A.*, 112: 424 (Feb. 4) 1939.

9. Henline, R. B.: Prostatic Disease with Special Reference to the Various Causes and Types as Well as Their Treatment, *South. Surgeon* 9: 360-368 (May) 1940.

10. Henline, R. B.: The Adequate Treatment of Prostatic Disease with Special Reference to Pathology, *New York State J. Med.*, to be published.

When it becomes desirable to remove the remnants of the functioning prostatic glands because of infection, calculi or a hard nodule in the prostate suggestive of a malignant neoplasm, it is essential to approach the prostate by the perineum.¹¹ Neither by the transurethral nor by the suprapubic approach is it possible to remove either these prostatic remnants or the posterior

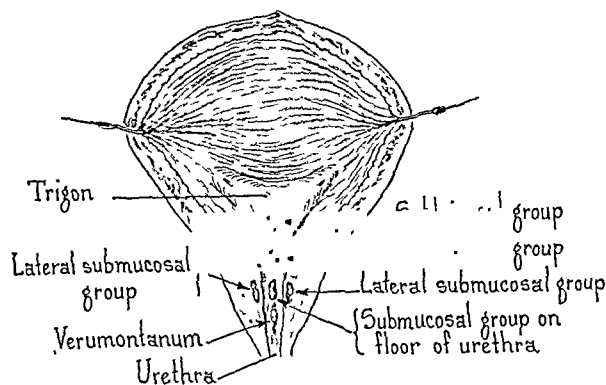


Fig. 5.—Localities where hyperplasia may develop

lobe of the prostate. The posterior lobe and the false prostatic capsule are separated from the hyperplastic mass in the prostate by a line of cleavage which permits the hyperplastic tissue to be cleanly "shelled out" suprapubically (fig. 3). The remnants of the prostate, in which it is estimated that 75 per cent of carcinoma develops (posterior lobe), must of necessity be left behind in either a suprapubic enucleation or a transurethral resection.

SUBTOTAL PERINEAL PROSTATECTOMY

New perineal operations have recently been devised.¹² Among these is a subtotal perineal prostatectomy devised by me primarily for the complete removal of prostatic calculi.¹¹ Results with this procedure have been so satisfactory that its use has been extended to the treatment of severe prostatic infection with hyperplasia, prostatic fibrosis in some cases, all early malignant neoplasms and extensive hyperplasia of the lateral lobe in some cases.

The method consists in the usual perineal exposure and removal of the entire prostate, capsule and prostatic portions of the urethra. Hemorrhage is controlled by sutures. The distal portion of the urethra is sutured around a catheter to the neck of the bladder and the prostatic portion of the urethra is thus entirely eliminated.¹¹

By this subtotal method¹³ the obstructing tissue as well as all remnants of compressed prostatic tissue may be completely removed. No focus of infection remains in the prostatic portion of the urethra to cause persistent urinary symptoms. The posterior prostatic lobe is removed, and hence a possible source of undiagnosed malignant growth is eliminated. The patient should be told that temporary or even permanent sexual impotence may result from this procedure.

When a suspiciously hard nodule is palpated in the prostate on rectal examination a perineal exposure, with complete removal of the prostate, offers the only hope

of cure should the growth prove to be early carcinoma of the prostate. The posterior lobe of the prostate can be reached only by the perineal approach, and the patient deserves to be operated on by the method which offers him a hope of cure. When it is considered that 1 of every 5 to 7 patients past the age of 50 has carcinoma of the prostate, is one not justified in removing the posterior lobe of the prostate, together with the obstructing portion of the gland, when the condition is suspected? Other methods of treating prostatic carcinoma are rarely curative and offer only relief from symptoms.

It is my custom to expose the prostate by opening the perineum when a suspicious nodule has been palpated. A small section of the suspected area is removed and a frozen section made at once. If carcinoma is discovered a radical perineal prostatectomy is performed, the entire prostatic portion of the urethra and the seminal vesicles being included. If biopsy proves the growth benign, either a conservative prostatectomy is performed, if indicated, or the perineum is closed. Exposure of the prostate by opening the perineum, with performance of biopsy, is far superior to repeated attempts to obtain a specimen with a needle through the perineum. A negative report on such a specimen proves nothing, since the involved area may be small and easily missed. In a recent case, taking a small biopsy by perineal exposure of the prostate removed the entire malignant area, and careful microscopic examination of the rest of the prostate and the seminal vesicles failed to reveal any sign of malignancy.

Since cancer of the prostate is so common, and until such time as conservative treatment of prostatic carcinoma proves more satisfactory as to cure and the prevention of the subsequent suffering, it may not be unreasonable to consider the advisability of removing the posterior prostatic lobe and capsule when surgical intervention must be instituted anyway for obstruction. Although I do not recommend this procedure routinely, the conclusions drawn from statistics may force the

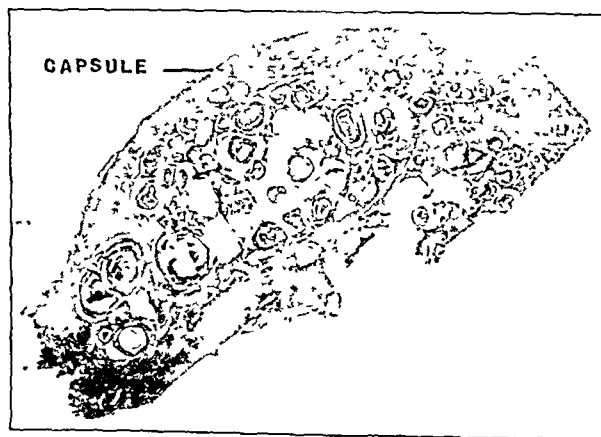


Fig. 6—Prostatic calculi. Note the presence of calculi throughout the functioning prostatic glands, extending to the outside surface of the capsule.

consideration of it in the future if patients are to be offered the best outlook for continued health.

I am opposed to the pessimism frequently voiced regarding carcinoma of the prostate. For a physician to palpate a suspiciously hard nodule in the prostate and "wait" to see what happens is a violation of the trust placed in him. It is only patients with such nodules that one can hope to cure of this disease, and

11. Henline, R. B.: Prostatic Calculi: Treatment by Subtotal Perineal Prostatectomy. *J. Urol.* 44: 146 (Aug.) 1940.

12. Melt, Elmer; Ebert, C. E., and Surber, A. C., Jr.: A New Anatomic Approach in Perineal Prostatectomy. *J. Urol.* 41: 482-497 (April) 1939. Gibson, T. E.: Improvements in Perineal Prostatectomy. *Surg., Gynec. & Obst.* 47: 531-539 (Oct.) 1928.

13. "Subtotal method" refers to removal of the entire prostate with the capsule and all prostatic tissue and is distinguished from radical total prostatectomy since the seminal vesicles are allowed to remain intact.

unfortunately most of them have no urinary symptoms! In the greater number of cases of prostatic carcinoma, when extension has occurred transurethral resection or perineal prostatectomy offers relief from urinary retention, and high voltage therapy often relieves the pain from metastases.

CONCLUSION

In conclusion, may I repeat that only the hyperplastic or fibrous mass may be removed by suprapubic "prostatectomy" or by transurethral resection. To enable one actually to remove the prostate gland, a perineal exposure is necessary. Only by perineum can the posterior lobe (the site of 75 per cent of malignant neoplasms of the prostate) be removed together with the compressed remnants of the functioning prostatic glands. Only by maintaining a clear conception of the various pathologic lesions which may involve the prostate and after proper study should one decide on the rational surgical procedure in each case. To treat all types of surgical prostatic disease by one method is not sound from a pathologic viewpoint. Surgeons are rightly considered inadequate if through lack of preliminary investigation, study and understanding of the pathologic process present they fail to approach the problem by the method particularly fitted to give adequate permanent relief.

SUMMARY

1. Each of the three main types of prostatic operation has its place, yet none should be used to the exclusion of the others.

2. The origin, extent and location of prostatic disease should always be considered in selecting the proper surgical approach to relieve the patient completely and permanently from his prostatic disorder.

3. Prostatic calculi may be more completely removed by subtotal perineal prostatectomy, with less morbidity and more permanent cure.

4. Perineal exposure, with removal of the posterior lobe of the prostate, is the only method of adequately removing an early malignant neoplasm of this portion of the prostate.

5. Newer perineal prostatic operations permit adequate control of hemorrhage and offer a means of completely removing the diseased prostate, often preventing postoperative morbidity, with greater assurance of permanent lasting relief from prostatism.

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ABSTRACT OF DISCUSSION

DR. HERMON C. BUMPUS JR., Pasadena, Calif.: Many years ago Dr. Geraghty reviewed a series of cases of cancer of the prostate and found the posterior lobe to be the most frequent site of malignancy. Not so long ago, Kahler examined by serial section over 400 glands and found the lateral lobes more frequently involved than the posterior lobes. The gist of Dr. Henline's paper is that, as every fifth patient with prostatism presumably has a malignant condition present, one is not justified in doing other than a perineal prostatectomy for fear the malignant condition may invade the posterior lobe. Perineal surgery is a highly technical procedure taught in relatively few clinics. How can the average surgeon expect to master this technic and at the same time acquire the more involved and difficult one of transurethral resection? However, all who have been trained in the fundamentals of surgery can do a suprapubic prostatectomy. This might seem deplorable if it did in fact deprive every fifth prostatic patient of a cure of his disease and statistics showed that perineal prostatectomy actually cured any appreciable number of cases. Such, unfortunately, is not the case, owing to the fact that the perineal lymphatics of the prostate drain directly into the sacrum. Careful pathologic investi-

gation has shown that there is no relationship between the extent of the malignant growth and the involvement of these perineal lymphatics. As a result, the early discovery of this disease means little as far as the chances of its cure are concerned but a great deal as far as the duration of the disease is concerned, for there are numerous untreated patients, except for the relief of their obstruction, who have lived over a decade from the time of its discovery. It is to be regretted that our literature does not contain reports of any series of patients treated by the perineal prostatectomy in which a sufficient number lived even over a five year period to make one certain that their survival was not due as much to the relief of their obstruction and the natural slow progress of the disease as to the eradication of the malignant growth. With few exceptions, urologists are far from satisfied with their end results in the treatment of prostatic cancer. In the great majority of cases relief of obstruction is what prolongs life, and our final results depend on the completeness with which this is done.

DR. CHARLES C. HIGGINS, Cleveland: Dr. Henline's initial sentences are of prime importance. Surgical diseases of the prostate present so many variations that any one surgical procedure will fail to obtain the best results in all cases. Patients enter the hospital with acute obstruction who cannot have a catheter introduced into the bladder, and a suprapubic puncture or cystostomy must be done. Some of these patients can have the resectoscope introduced after preliminary drainage, but others cannot. Another group of patients are those with complete retention in which futile attempts to catheterize and evacuate the urine have been made. Metal sounds have been passed, the urethra has been torn, the penis is swollen, and the patient may have urethritis or unilateral or bilateral epididymitis. In these instances I would hesitate to perform a transurethral resection. A third group are patients with carcinoma of the prostate. I agree with Dr. Bumpus in that, when it is impossible to remove the malignant disease surgically in a very large prostate, transurethral resection is preferred. The fact must be appreciated that at some time the malignant lesion in the prostate was a local disease. Therefore, if a small nodule is palpated in a man aged 50, regardless of whether or not he has residual urine, one is justified in exposing the prostate by the perineal approach, securing a biopsy. If it is not malignant and merely an adenoma, the incision can be closed; if it is malignant, a radical procedure can be undertaken. The morbidity is much less in suprapubic prostatectomy, but personal preference also influences the choice of operation. The patients who present some discussion are those with grade 3 and grade 4 enlargements of the prostate. A sufficient amount of prostatic tissue can be removed to provide the patient an adequate channel so that he can entirely empty his bladder. However, many of these patients have a persistent pyuria which does not clear up until the prostate is removed. Microscopic examination of this prostatic tissue shows numerous infarcts and multiple abscesses. In the majority of instances it is not necessary to have an intensive preoperative regimen for patients who undergo transurethral surgery, provided there are no complications. However, the complications that may occur following operation must be anticipated. I have seen postoperative hemorrhage after transurethral resection. The patient loses large amounts of blood, which necessitates taking the patient to the operating room, evacuating the clots from the bladder and again introducing the resectoscope to control the bleeding point. Occasionally, postoperative pneumonia will develop. If that patient's preoperative routine has been minimized, a higher operative mortality may be anticipated.

DR. FRANKLIN FARMAN, Los Angeles: I should like to present a somewhat different approach to the problem of prostatic surgery. Most indications for surgery are based on the anatomicopathologic picture found at the bladder neck; however, as a rule only the doctor himself understands this setup. In talking to patients I have found the following outline useful: most people place themselves in certain age groups and likewise does the "prostatic": From 50 to 60, resection or endocrine therapy; from 60 to 70, resection or one stage prostatectomy; from 70 to 80, two stage prostatectomy or resection; from 80 to 90, fractional resection, delayed two stage, permanent cystostomy, "catheter life." Between the ages of 50 and 60 one

encounters more frequently early benign adenoma, fibrous bar or commissural hypertrophy alone, and for these patients resection is ideally suited, mortality is nil and the functional result is good. At this stage, endocrine treatment (testosterone) is being tried with moderately encouraging results, and it is my belief that the field for glandular replacement therapy is greatest in the incipient stages of prostatic disease. Between the ages of 60 and 70, more extensive benign prostate enlargements and early carcinoma make their appearance. Life expectancy is fully ten years, and any contemplated surgery should keep this in mind, so as to insure the patient complete relief thereafter. Does resection always do this? During the past winter I have seen 5 patients on whom resection has been performed by five different doctors in the Midwest, all with recurrence of bladder difficulty, hematuria, stricture or infected residual urine. As the later decades of life are reached, complications are more frequent, operative hazard is increased and differentiation of cases becomes more necessary. In the age group 70 to 80, grade 3 and 4 benign adenoma, frank carcinoma, acute and long standing retention, urinary infection and lithiasis, damaged kidney function, arteriosclerosis, myocarditis and hypertension are factors of greater or lesser significance. Life expectancy is correspondingly shortened. The choice of method here has great influence on mortality and morbidity and depends on personal skill, available hospital equipment and assistance, the locality in which the patient resides and the objective in treatment—relief of symptoms or cure. Although the mortality rate is somewhat higher for total prostatectomy than for resection in this group, morbidity figures generally are lower. Paradoxical as it sounds, resection is advocated by some for both the "good risk" and the "poor risk" patient. This is true to a certain extent when considering the last age group beyond 80 years. Life expectancy is short and palliative relief usually is the objective, which may be accomplished by partial or fractional resection, delayed two stage, or permanent cystostomy.

DR. V. D. LESPINASSE, Chicago: Dr. Henline's paper is a plea to consider prostatic disease as a group of diseases, to consider it the same as we do intracranial, abdominal or pleural disease. There are many methods available and there are many different types of pathologic conditions that we need to relieve. Our methods of examination give us three aspects: (1) the intravesical aspect, (2) the perineal and (3) the urethral. Those methods will demonstrate the exact pathologic condition, and the problem is how best to get rid of that condition. If it is a small obstruction in the urethra there is no advantage, in fact it is foolish to do anything but a local urethral destruction. If there is a pathologic lesion in the bladder, it seems to me that the easiest and best way to remove it is to go into the bladder. If the pathologic process is on the rectal side of the prostate, then the most accessible way to get at it is through the perineum. If one studies the case better and considers the pathologic condition of the particular patient, one most certainly will obtain better results. As far as the various points of technic are concerned and the saying of *carte blanche* to do it above or below, I don't think that is profitable to discuss: For my own abilities I can do a total anatomic removal of the prostate suprapubically from the membranous urethra to the urethral orifices, unite the trigon of the bladder to the urethral orifice as it comes through the urogenital ligament, and wrap a few Wilson's muscles or the puboprostate ligament around it and obtain a nice result with little mortality. Patients are well pleased and their carcinoma is no longer in their body. Whatever way one works, one must pay attention to the pathologic lesion and remove it; then one will have some excellent results.

DR. ROY B. HENLINE, New York: Dr. Bumpus mentioned the pertinent fact that pathologists often disagree on the diagnosis of prostatic cancer. Various articles written on this subject tend to confuse the issue on the origin and progression of prostatic cancer. In my text I did not refer to Dr. Geraghty's original paper on prostatic cancer when I stated that approximately 75 per cent of these cancers originated in the posterior lobe of the prostate. I referred to two recent, very careful, investigations by Moore and Rich, who independently found the posterior lobe of the prostate to be the site of origin of approximately 75 per cent of prostatic cancers. As long as pathologists agree that most prostatic cancers originate in the posterior lobe,

we as urologists should treat our patients by that method which will adequately remove this involved area. Apparently Dr. Bumpus misunderstood one of my purposes in presenting this paper. For fear that others may have misunderstood I should like to reiterate that I am not recommending perineal prostatectomy to the exclusion of other types of surgery. The latest statistics show that perineal prostatectomies are performed in approximately 30 per cent of patients, transurethral resection in 60 per cent and suprapubic enucleation in 10 per cent. I believe that the type of surgery employed should depend on the pathologic condition present in the prostate. To attain this goal, perineal prostatectomy must be employed for some patients. Dr. Bumpus also stated that the technic of perineal surgery is difficult. I find it more difficult to teach the resident staff transurethral resection than perineal surgery. I believe that proper transurethral surgery is among the most difficult urologic procedures one has to perform. If Dr. Bumpus had done as many perineal prostatectomies as he has transurethral resections he would find that learning perineal surgery is much easier than learning transurethral surgery. If I have brought out no other point, I should like once more to stress that not all patients with prostatic disease should be treated by any one method.

INTRASPINAL THERAPY OF NEUROSYPHILIS

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A great number of articles in the literature from 1910 until the early 1930's attest the value of intraspinal methods in the treatment of neurosyphilis. However, since the advent and ensuing favor of various other measures, this method of therapy gradually has been discarded by many syphilotherapists and we think unjustifiably so.

In appraisal of the methods of treatment dealt with in three papers from the Cooperative Clinical Group,²⁷ it must be remembered that the various forms of supplemental therapy in general were used only after routine therapy had failed and many of the patients had more than one type of supplemental treatment. The conclusions that were reached in the aforementioned papers, therefore, do not constitute a true comparative evaluation of the symptoms of treatment but rather constitute contrast of one method with another when simpler methods failed to produce the desired clinical and serologic results. For example, a comparison of intraspinal therapy with routine treatment cannot be made on a numerical basis because intraspinal therapy was administered usually to patients whose condition was resistant and who had failed to improve under routine treatment. However, the three reports clearly indicate the value of intraspinal therapy in certain forms of neurosyphilis, especially in mild or early tabes dorsalis and in the asymptomatic, meningeal and meningovascular forms of neurosyphilis.

From the Section on Dermatology and Syphilology, Mayo Clinic.

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Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

27. O'Leary, P. A.; Cole, H. N.; Moore, J. E.; Stokes, J. H.; Wile, U. J.; Parran, Thomas; Vonderlehr, R. A.; and Usilton, Lida J.: Cooperative Clinical Studies in the Treatment of Syphilis: Asymptomatic Neurosyphilis. *Ven. Dis. Inform.* 18: 45-65 (March) 1937; *Tabes Dorsalis*, *ibid.* 19: 367-396 (Nov.) 1938. O'Leary, P. A.; Kierland, R. R.; Cole, H. N.; Binkley, G. W.; Wile, U. J.; Stokes, J. H.; Ingraham, N. R., Jr.; Moore, J. E.; Padgett, Paul; Kemp, J. E.; Parran, Thomas; Vonderlehr, R. A.; Usilton, Lida J., and Vandoren, Eleanor: Cooperative Clinical Studies in the Treatment of Syphilis: Asymptomatic Neurosyphilis, *ibid.*, to be published.

THEORIES OF THE MECHANISM OF ACTION OF INTRASPINAL THERAPY

There are essentially four theories concerning the mechanism of action of the various forms of intraspinal therapy. These are that:

1. The amount of arsenic introduced into contact with the cerebrospinal fluid, although small, has a definite antisymphilitic action.
2. As a result of the introduction of the foreign material there results an increased permeability of the meninges due to meningeal irritation, which increases the concentration in the cerebrospinal fluid of arsenic, bismuth and other antisymphilitic drugs administered intravenously or intramuscularly.
3. The antibodies which are brought forth in the blood as the result of the primary injection of arsphenamine are transferred in the serum to the cerebrospinal fluid.
4. There is a nonspecific protein effect produced by the introduction of the blood serum into the spinal canal.

It is probable that all these theories play more or less definite roles in the production of the good clinical and serologic results obtained from intraspinal therapy. However, it is not our intention to discuss in detail these theoretical considerations of the mechanism of action of intraspinal treatment or to evaluate other similar types of treatment, such as spinal drainage and cisternal drainage, although we have had some experience with such methods. The results to be given in this report deal only with the so-called Swift-Ellis type of intraspinal therapy. For several years, reinforcement of the blood serum with minute doses of arsphenamine according to the method of Ogilvie was carried out but was discontinued because the results did not warrant the additional hazard incurred by the method.

SCOPE OF THE STUDY

This survey is based on the study of 370 patients suffering from various types of neurosyphilis who had received a total of two thousand, three hundred and sixty-nine intraspinal treatments, an average of six and four-tenths treatments per patient. The largest number of treatments administered to one person was thirty-nine and the smallest number one. These patients were treated during the years 1924 through 1927 and were selected because of the opportunity thus presented for a prolonged follow-up study.

TECHNIC OF INTRASPINAL THERAPY

Twenty to thirty minutes after an intravenous injection of arsphenamine or neoarsphenamine, 50 cc. of blood is aseptically withdrawn into sterile containers. The blood is allowed to stand until the serum separates and the serum then is pipetted off into another sterile container of a capacity of approximately 50 cc. The remaining clotted blood and serum are centrifuged and the remaining serum is again pipetted. Usually, 20 to 25 cc. of serum is obtained. The serum is then stored in a refrigerator overnight and in the morning it is heated to 56 C. for seventy minutes to destroy the complement; it is then centrifuged again to separate the few erythrocytes that may be present. This must all be done by means of a rigidly strict sterile technic.

Lumbar puncture is then done in the usual manner (in the fourth or fifth lumbar interspace) and 20 to 25 cc. of cerebrospinal fluid is removed, of which 10 cc. is saved for the globulin, cell count, protein, colloidal gold and serologic determinations; the rest of the fluid is discarded. The blood serum is then added to a gravity tube and allowed to flow into the subdural space by gravity; no pressure or force of any type need be

employed when the serum is being introduced into the spinal canal. The patient is then kept in bed for twenty-four hours. The foot of the bed is elevated about 8 inches for six to eight hours and the patient is urged not to use a pillow for twelve to eighteen hours.

Each intraspinal treatment is administered at two week intervals and three such treatments are considered to constitute a course. During this six week period the neurosyphilitic patient also receives routine treatment in the form of an injection of arsphenamine once weekly, heavy metal (either mercury succinimide five times weekly or bismuth two or three times weekly) and potassium iodide by mouth or sodium iodide intravenously.

The patient who has cardiovascular syphilis and only coincidental neurosyphilis for whom the administration of arsphenamine is contraindicated may receive so-called foreign arsphenaminized serum with benefit. In this modification the arsphenamine is administered first to another syphilitic patient; blood is withdrawn from this patient and the serum is extracted in the usual manner. The arsphenaminized serum thus obtained is then administered intraspinally to the patient who has both cardiovascular syphilis and neurosyphilis.

REACTIONS

In the total number of two thousand three hundred and sixty-nine treatments there were two hundred and twenty-nine reactions in 109 patients of sufficient degree to warrant their having been recorded in clinic files, an incidence of 9.7 per cent. These reactions were classed as "slight," "moderate" or "severe";²⁸ there were ninety-three slight reactions (3.9 per cent of the total number of treatments), ninety moderate reactions (3.8 per cent) and forty-six so-called severe reactions (1.9 per cent).

It is interesting to note that 39 per cent of all reactions occurred in a small group of 18 patients, and in this group it was necessary to discontinue intraspinal therapy for only 1 patient, a tabetic patient in whom increasing ataxia developed after intraspinal treatment; and, although there was some question as to the part played by the treatment in the production of the ataxia, it nevertheless was included among the reactions.

Reactions occurred most frequently among the tabetic group of patients for whom therapy provoked increased pains in the leg and/or gastric crises of varying degrees. There were 8 patients among the entire group for whom it was necessary to discontinue intraspinal therapy because of the occurrence of reactions of one type or another.

The reactions noted most commonly were those referable to ordinary lumbar puncture and slight to severe headache, which may or may not have been associated with nausea and vomiting. Two hundred of two hundred and twenty-nine reactions constituted headache, nausea and vomiting and increased pains in the legs.

Among the severe complications was 1 instance of meningitis, from which the patient recovered within three weeks' time without residual difficulty. In 5 cases complications developed which were referable to the

28. Slight reaction: Symptoms of the type of headache which often follows lumbar puncture, increased pains in legs and mild degrees of nausea and vomiting lasting less than twenty-four hours. Moderate reaction: Reactions in this group sometimes endured up to forty-eight hours. Patients sometimes required periods of rest in bed and sedation. Symptoms were of the same general type as those which follow lumbar puncture. Severe reaction: Reactions of the severe type lasted for more than 48 hours and required rest in bed and sedation. Provocation of pains in legs and gastric crises by the Swift-Ellis treatment and the occurrence of meningitis also are included in this group.

bladder. Three of the patients who had vesical complication received additional intraspinal treatment without the recurrence of complications. For the other 2 patients additional Swift-Ellis treatment was not attempted. In 2 cases transverse myelitis developed after the use of intraspinal therapy; however, both of these patients recovered without evidence of residual neurologic effects and 1 was able to tolerate additional intraspinal therapy without subsequent disturbance. One patient manifested saddle anesthesia; however, he also was able to tolerate Swift-Ellis treatment later without any untoward reactions.

It is to be remembered that, during the twenty-four year period in which intraspinal therapy has been used in the clinic, more than twelve thousand such treatments have been administered and that complications such as meningitis, retention of urine and transverse myelitis have developed among patients other than those considered in this study. Such reactions, however, are uncommon, since in the present series of two thousand three hundred and sixty-nine consecutive intraspinal treatments administered during the years 1924 to 1927 only nine troublesome complications occurred.

RESULTS

The consecutively selected records in this study concern a group of 370 neurosyphilitic patients who received one to thirty-nine intraspinal treatments in conjunction with therapy with arsphenamine, neoarsphenamine or sulfarsphenamine and mercury or bismuth compounds and, in the majority of instances, with iodides. Two hundred of these patients were observed and/or treated for five years or longer. These 200 patients who have had treatment and have been observed for periods of five years or more form the basis of the clinical and serologic results to be described hereafter. For 178 of these 200 patients, treatment was started by a combination of routine and intraspinal therapy.

The various manifestations of neurosyphilis in this group were diagnosed as follows: asymptomatic, tabes dorsalis, the tabetic form of dementia paralytica, dementia paralytica, meningeal and meningovascular. There were only 2 cases of purely vascular neurosyphilis, and these have been included with the meningovascular group of cases of neurosyphilis and the tabetic form of dementia paralytica.

Asymptomatic Neurosyphilis.—Thirty-two patients (16 men and 16 women) had asymptomatic neurosyphilis; their ages varied from 5 to 50 years. Nine of these patients previously had received various degrees of intravenous and intramuscular antisyphilitic therapy²⁹ and in 4 of the 9 the reaction to serologic tests of the blood was negative when they came under our observation. With routine treatment, plus the addition of intraspinal therapy, the blood became normal for 24 additional patients. According to classification by types of cerebrospinal fluid encountered, 7 patients had group I spinal fluid, 22 had group II spinal fluid and 3 had group III spinal fluid. Explanation of the classification of the three types of spinal fluid may be found in table 1. Twenty-five patients obtained reversal of the condition of the spinal fluid by means of intraspinal and routine treatment alone. Reactions to tests

of the spinal fluid of 4 patients remained positive in spite of treatment, and in 3 patients reactions to such tests relapsed to positive.

Four patients received malaria therapy in addition to routine and intraspinal treatment. One of these 4 patients, because of previous intensive treatment before the patient was seen by us, received therapy with malaria fever first, and then routine and intraspinal treatment. The spinal fluid of this patient first became normal nine years after fever therapy. The second patient received fever therapy with malaria because the reactions of tests of the spinal fluid relapsed to positive, whereas the other 2 patients of this group of 4 received treatment with malaria because of persistently positive reactions to tests of the spinal fluid. Reactions to such tests in 1 of these 2 cases remained positive five years after the addition of malaria therapy, whereas the other patient had negative reactions to the tests. One other patient received sodium N-phenylglycinamide-p-arsenate (tryparsamide) without benefit to the spinal fluid.

There were 3 cases in which reactions to tests of the spinal fluid relapsed and became negative with additional treatment. Reactions to tests of the fluid of 1 of the patients relapsed on routine treatment, and the

TABLE 1.—General Classification by Group of Spinal Fluid According to the Degree of Abnormality Found on Examination by Each of the Four Indicated Procedures

Group	Reaction to Test Indicated		Cells per Cu. Mm.	Colloidal Benzoin or Gold Curve
	Wassermann	Globulin		
I	Negative or weakly positive	Positive or negative	10-20	000 000 333 000 000 0 0 0 3 3 3 0 0 0
II	Positive	Positive	20-100	000 000 333 000 000 0 0 0 3 3 3 0 0 0 021 221 333 310 000 0 1 2 5 5 6 3 0 0 0
III	Strongly positive	Positive	30-100 10-30* 10-30†	333 333 331 000 000 5 5 5 5 5 4 3 2 1 0

* Large lymphocytes
† Polymorphonuclear cells.

spinal fluid became normal with the addition of intraspinal treatment. The second patient required therapy with malaria to bring about the desired normality of the spinal fluid, whereas the spinal fluid of the third patient reverted to normal with further intraspinal treatment and remained normal.

In 17 of 28 cases reactions to tests of the cerebrospinal fluid that became negative did so within a year or less; reactions in 6 more cases became negative within one to two years, whereas in the other 5 cases the reactions became negative within two to nine years.

The 32 patients who had asymptomatic neurosyphilis received from one to thirteen intraspinal treatments each, in addition to arsphenamine, a heavy metal and iodides; of these 32 patients, 29 received three or more intraspinal treatments in conjunction with routine treatment. These 29 patients underwent a total of two hundred and thirty-eight intraspinal treatments, an average of eight per patient.

Symptomatic neurosyphilis did not afflict any patient in the group.

Tabes Dorsalis.—Fifty of 200 neurosyphilitic patients had tabes dorsalis; 6 of these 50 had optic atrophy. The youngest was 8 years of age and the oldest was 55. All but 7 were males. Twenty-one patients had had some type of antisyphilitic treatment before coming under our care. Results of serologic tests of the blood

29. Hereinafter when we speak of "previous therapy" we will mean "antisyphilitic treatment administered prior to the patient's coming under our care." Almost invariably this treatment was inadequate, according to present day standards; that is, it had consisted of less than thirty intravenous injections of arsphenamine and six intramuscular injections of a heavy metal. Many of these patients had previously received only oral medication with mercury or iodides.

of 8 patients who had received no previous treatment were negative when the patients were first seen, and results of such tests of 6 patients who had received previous antisyphilitic treatment were negative when the patients were first seen. At the end of our treatment and observation period, reactions to serologic tests of the blood of 36 patients were negative, whereas such reactions concerning 14 patients were still positive.

Seven persons had group III spinal fluid, 33 had group II fluid and 10 had group I fluid. By virtue of the use of all types of treatment at our command, at the end of treatment and observation reactions to tests of the spinal fluid of 40 patients became negative, whereas such reactions among 10 patients were still positive (in all the fluid was of group I). Thirty patients received routine and intraspinal treatment alone; the spinal fluids of 26 patients became normal and reactions to tests of the spinal fluid of 4 patients remained positive. Condition of the spinal fluid relapsed in 5 instances, but in each of these instances the spinal

TABLE 2.—Clinical Results of Intraspinal and Routine Treatment Before Institution of Other Types of Treatment

Type of Neurosyphilis Present	Cases	Result							
		Decidedly Improved		Slightly Improved		Arrest or No Change		Condition Progressed	
		No.	%	No.	%	No.	%	No.	%
Asymptomatic....	31	..	....	..	....	..	....	0	....
Tabes dorsalis....	48	23	53.3	13	27.0	5	10.4	2	4.2
Tabetic dementia paralytica, vascular and meningo-vascular.....	45	25	55.5	9	20.0	6	13.3	5	11.1
Dementia paralytica.....	16	5	31.2	3	18.7	6	37.5	2	12.5
Meningeal.....	38	34	89.5	2	5.3	2	5.3	..	....

fluid became normal with further treatment of the patients, 3 of whom received malaria therapy and 2 of whom received Swift-Ellis treatment only.

Of the 19 patients who received malaria treatment plus intraspinal therapy, 5 still had spinal fluid which reacted positively to tests.

Only 2 patients in this particular group received tryparsamide; 1 received it alone with intraspinal treatment and 1 received it with both malaria therapy and intraspinal treatment. Nineteen patients received malaria treatment, 3 because of relapse of reactions to serologic tests, 2 because of clinical progression of the disease, 1 because of reactions from intraspinal treatment, 6 because the condition of the spinal fluid failed to respond and 5 because intraspinal treatment gave neither clinical progression nor improvement. For 2 of these 19 patients treatment had been started with fever produced by means of malaria. In the 2 cases in which clinical progression of the disease occurred, the condition in both became clinically arrested with the addition of malaria therapy. Of the 5 patients who did not respond to treatment, 3 remained in the same condition, 1 improved remarkably and 1 improved slightly.

In the group of 30 patients who received routine treatment plus intraspinal treatment alone there was no progression of symptoms, subjectively or objectively, whereas 24 of these patients obtained decided improvement; 20 4 obtained slight improvements and 2 exhibited no change.

30. This is considered as constituting subjective improvement manifested by the patient and expressed by him and noted by improvement in somatic complaints, gain of weight, improved appearance and sense of well being. Neurologic signs (objective symptoms), such as pupillary and other changes in reflexes, sense of position and pain, did not change with the patients under antisyphilitic treatment and observation.

However, when intraspinal treatment in the whole group of 50 patients failed to produce satisfactory clinical results, the use of other types of supplementary treatment such as malaria therapy and/or tryparsamide produced for 31 patients decided improvement in subjective signs and symptoms, slight improvement in such signs for 13 and no improvement for 6. The condition of no patient progressed.

Six of the 50 patients had optic atrophy in addition to other signs and symptoms of tabes dorsalis. For 2 of these 6 patients the type of antisyphilitic treatment first used was malaria therapy; 2 of the 6 showed progression of optic atrophy under intraspinal treatment and received malaria therapy in an effort to halt this progression. Two of the 6 patients had no further loss of vision on receiving routine and intraspinal therapy.

For only 4 tabetic patients did the spinal fluid become normal in less than a year. The longest period required for a positive reaction to revert to negative was eight years; this period was required for 3 patients. In the majority of cases the reactions to tests of the fluid became negative in one year to three years.

One patient received less than three intraspinal treatments. The remaining 49 patients suffering from tabes dorsalis received a total of three hundred and ninety-one such treatments, an average of about eight per patient.

Dementia Paralytica.—Thirty-four of these 200 neurosyphilitic patients had dementia paralytica, and of these 34, 13 had received previous antisyphilitic treatment. Generally dementia paralytica encountered among these patients was in a very early stage, and although many of them were euphoric and had grandiose ideas, in none was the condition in a vegetative stage. The youngest patient was 10 years old and the oldest was 53 years old. There were 2 women in this group. One patient had not received previous treatment and was found to have negative reactions to serologic tests of the blood. In 1 case reactions to serologic tests of the blood were negative, the patient having had previous treatment. Eleven patients still had positive reactions to serologic tests of the blood after treatment and an observation period of five years or longer.

Twenty-five patients had cerebrospinal fluid of group III, 8 had fluid of group II and 1 had fluid of group I on admission; at the end of our treatment and observation, 23 had normal spinal fluid, 9 had fluid of group I and 2 still had fluid of group III.

Among the 23 cases in which reactions to tests of the spinal fluid reverted to negative, in only 1 did the reaction revert to negative in less than a year; the spinal fluid of 2 persons became normal in one to two years; in 15 cases from two to five years were required for the reactions to reverse, and in 5 cases five years or more were required for the reactions to become negative. The longest period required for the fluid to become normal was thirteen years.

In 4 cases the reactions to tests of the spinal fluid relapsed; in 3 cases the reactions reverted to negative with further treatment of the patients, and in these three cases fever treatment with malaria was administered because of the relapse.

It is difficult to appraise the value of intraspinal therapy in this particular group of patients because of the fact that 16 patients also received malaria therapy and intraspinal treatment. 1 received treatment with tryparsamide and intraspinal therapy and 14 received therapy with both malaria and tryparsamide in addition to intraspinal treatment. Only 3 patients received intraspinal treatment and routine treatment alone, of whom

2 were decidedly improved and one was slightly improved. Thirteen others received the Swift-Ellis treatment before the institution of other methods of treatment. Three of these 13 patients received other types of therapy because of relapse of the reactions to tests of the spinal fluid; 10 of these 13 patients received other therapy because of failure of improvement as manifested by either reactions to serologic tests or remission of clinical symptoms. In 2 cases the disease showed evidence of clinical progression on intraspinal treatment of the patients but improvement was obtained with malaria therapy.

For 17 patients the first treatment administered was malaria, and 1 received tryparsamide. Follow-up therapy consisted of intraspinal treatment or administration of tryparsamide, or both. Of 11 who received malaria therapy first, plus intraspinal and routine treatment alone, 8 were decidedly improved, 2 were slightly improved and 1 became worse. Of 14 patients who received malaria therapy, followed by intraspinal treatment plus therapy with tryparsamide, 8 patients were decidedly improved, 4 were slightly improved and 2 became worse.

With all types of treatment, 22 patients were decidedly improved, 9 were slightly improved and 3 became worse.

Two patients received only one intraspinal treatment each; the largest number of treatments received by any 1 patient was thirty-nine. A total of three hundred and fourteen injections were made for 32 patients, an average of nine and eight-tenths injections each.

Meningeal Neurosyphilis.—Thirty-nine patients out of the series of 200 had meningeal neurosyphilis; the youngest of these was 21 years old and the oldest was 60 years old. All but 5 were men. Twelve had received previous antisyphilitic treatment before they came under our care. Two patients who had negative reactions to serologic tests of the blood had received no previous treatment, and 1 patient who had negative reactions to

fluid of group III was present and malaria therapy was administered without complete reversal of the condition of the spinal fluid; the other patient showed no improvement whatever in the condition of the spinal fluid, although results of serologic tests of the blood

TABLE 4.—*Serologic and Clinical Results Obtained from Routine Treatment Only in Neurosyphilis: Statistics of Cooperative Clinical Group*

Type of Neurosyphilis Present	Reversal of Reactions to Serologic Tests of Cerebrospinal Fluid			Decided Clinical Improvement		
	Num-ber, Total	Reversals, Num-ber *	Per Cent *	Num-ber, Total	Decided Improve-ment, Number	Per Cent
Asymptomatic.....	203	139	68.5			
Tabes dorsalis.....	396	114	28.8	286	44	15.4
Tabetic dementia paralytica, vascular and meningovascular.....	187	69	36.8	148	41	27.7
Dementia paralytica.....	57	6	10.5	25	4	16.0
Meningeal.....	88	50	56.8	71	55	77.5

* Total of cases in which reactions to tests were reversed at five years.

did become negative. The patient showed no progression of symptoms in an eight year treatment and observation period.

Of 36 instances in which the spinal fluid became normal, the fluid in 21 became normal within a year or less, in 8 instances the fluid became normal within the one to two year period and in the other 7 instances the fluid became normal in the two to five year period. In 2 instances reactions to tests of spinal fluid relapsed to positive; in both the reactions became negative again and remained so. One relapse occurred in an uncooperative patient, the other in a patient whose reactions had relapsed twice and who, at the second relapse, received malaria treatment. None of the patients received tryparsamide, but 8 received malaria therapy or typhoid vaccine. One patient received malaria therapy first of all because his spinal fluid was found to be of group III. All but 2 of the remaining 7 patients (of the 8 who received malaria therapy or vaccine) had obtained decided clinical improvement before we proceeded with fever therapy; the sixth patient showed improvement only after the addition of typhoid vaccine to the therapeutic armamentarium, whereas the seventh patient showed no improvement after any type of therapy; this particular patient had convulsions, and it is questionable how much of a part the syphilis had in the production of the condition. Intraspinal therapy used alone or administered before other methods of therapy accounted for thirty-four decided improvements and for two slight improvements. There were no clinical data in 1 case.

No patient in this group of 39 received less than three intraspinal treatments, and the most received by 1 person was thirteen. There was a total of three hundred and thirteen Swift-Ellis treatments, or an average of about eight treatments per patient.

Tabetic Dementia Paralytica; Vascular and Meningovascular Neurosyphilis.—In this series 19 had the tabetic form of dementia paralytica, 2 had vascular neurosyphilis and 24 had the meningovascular form of neurosyphilis, a total of 45 patients. The ages varied between 4 and 55 years, and only 8 of the 45 patients were women. Seven patients had negative reactions to serologic tests of the blood, and all but 2 of these 7 patients had undergone previous treatment. After

TABLE 3.—*Serologic Effects of Intraspinal and Routine Treatment on the Cerebrospinal Fluid Before Institution of Other Methods of Therapy*

Type of Neurosyphilis Present	Condition of Cerebrospinal Fluid (Reaction)								
	Cases	Complete Reversal		Improved but Still Positive		Stationary or Worse		Relapse *	
		No.	%	No.	%	No.	%	No.	%
Asymptomatic....	31	25	80.6	3	9.7	1	3.2	3	9.7
Tabes dorsalis....	48	26	54.1	15	31.2	5	10.4	5	10.4
Tabetic dementia paralytica, vascu- lar and meningo- vascular.....	45	23	51.1	13	28.8	6	13.3	8	17.7
Dementia para- lytica.....	16	2	12.5	7	43.7	3	18.7	4	25.0
Meningeal.....	38	33	86.8	3	7.9	1	2.6	2	5.3

* Partial overlapping of percentages with those in column headed "complete reversal."

serologic tests of the blood had received previous treatment. Under treatment, reactions to serologic tests of the blood became negative in all but 3 cases.

All reactions to tests of spinal fluid were positive. The fluid in 9 cases was of group III, in 1 it was of group I and in the remaining 29 cases it was of group II. In all but 3 of the cases reactions to tests of the spinal fluid became negative during the five year period of treatment and observation. In 2 of these 3 cases spinal

treatment and observation by us, all but 6 patients had negative reactions to serologic tests of the blood. Twenty of the 45 patients in this group had received previous antisyphilitic treatment.

In 15 cases the spinal fluid was classified as being of group III, 27 patients had spinal fluid of group II and 3 had spinal fluid of group I.

In 34 cases the spinal fluid became normal under treatment and observation; in the majority of these cases the fluid became normal within one and three years. In 23 cases the fluid became normal with the use of routine and intraspinal treatment alone, and in 11 cases the addition of malaria or tryparsamide therapy or both to the routine and intraspinal routine of treatment accomplished this result. In 11 cases reactions to tests of the spinal fluid remained positive; 8 of the 11 patients received fever treatment with malaria, 2 received therapy with tryparsamide and 1 patient received only routine and intraspinal treatment.

In 8 cases the condition of the spinal fluid relapsed; reactions in 7 of these cases reverted again to negative with further treatment, in 3 of these the reactions became negative when further intraspinal treatment alone was given, in 3 cases the reactions became negative with the addition of malaria treatment to the schedule of therapy, and in 1 instance of relapse after the use of both intraspinal treatment and malaria treatment, the reactions became negative with therapy with tryparsamide and typhoid vaccine.

Well defined clinical improvement was obtained for 18 patients who received routine and intraspinal treatment alone, whereas 4 patients showed slight improvement and 2 patients exhibited neither progression of symptoms nor improvement. Of 19 patients who received malaria therapy, 11 received it because intraspinal treatment had failed either clinically (6 patients) or serologically (5 patients); the other 8 patients, however, exhibited varying degrees of improvement before malaria therapy was employed (6 patients exhibited decided improvement and 2 improved slightly). Of the 2 patients who received intraspinal treatment plus tryparsamide, 1 showed much improvement and 1 slight improvement before tryparsamide was administered. With all types of treatment, 28 patients were decidedly improved, 11 were slightly improved, 5 showed no change and the condition of 1 patient progressed.

Only 1 patient received less than three intraspinal treatments, whereas the largest number administered to any patient was fifteen. The remaining 44 patients (of the 45 in this group) received a total of three hundred and eighty-one treatments, an average of eight and two-tenths Swift-Ellis treatments per patient.

Tables 2 and 3 show the results obtained clinically and serologically by intraspinal treatment before addition of the other therapeutic measures of malaria, typhoid vaccine and/or tryparsamide.

In table 4 the serologic and clinical results obtained from routine treatment only by the Cooperative Clinical Group are listed. These results should be compared with the results in our cases obtained by a combination of intraspinal and routine treatment, as set forth in tables 2 and 3.

COMMENT

A rather characteristic trend was noted of the condition of the cerebrospinal fluid of patients who subsequently exhibited improvement from intraspinal therapy. The first indication of benefit was found in the rapid

diminution of the cell count, although not uncommonly after the first intraspinal treatment there was a slight increase in this count denoting meningeal irritation. With subsequent treatment, however, this increase was noted only occasionally. In many instances, especially in cases of meningeal, asymptomatic, meningovascular neurosyphilis and in tabes dorsalis, the cell count was within normal limits at the end of the first course of intraspinal treatment. Because of the lability and sensitivity of the cell count of the cerebrospinal fluid, a decrease of the cell count of the fluid is a helpful prognostic guide in forecasting the subsequent changes of the spinal fluid after intraspinal treatment.

Next in order of responsiveness to intraspinal treatment was the flattening of the colloidal gold or colloidal benzoin curves (table 1). This sign of improvement, however, frequently lagged behind improvement as denoted in the cell count for from months to several years, whereas changes signifying improvement in results of the globulin and Wassermann tests were the last to appear. The latter two factors closely paralleled each other.

The value of classification of observations concerning the spinal fluid into three groups was further substantiated by this study. Patients with fluid of group I or group II generally do well under intraspinal therapy, whereas those who have fluid of group III have a tendency to be resistant to all but the combination of nonspecific and specific remedies. Dementia paralytica, which is accompanied by the highest percentage of cerebrospinal fluid of group III, is resistant to Swift-Ellis therapy. However, as brought out by the Cooperative Clinical Group, meningeal neurosyphilitic persons who have fluid of group III respond more readily than do patients with dementia paralytica who have a similar type of cerebrospinal fluid.

In general, the shorter the duration of neurosyphilitic symptoms the more rapid the response to intraspinal therapy was found to be. This trend did not necessarily pertain to the duration of syphilis, because those patients among whom neurosyphilitic symptoms developed early in the course of their disease often were resistant to all forms of treatment.

Certain valid criticisms may be made of a paper of the type of this one. First is the fact that an adequate series of control cases is lacking. The ideal method would be to start routine treatment alone for a large number of patients suffering from neurosyphilis and then to begin routine treatment plus one type of supplemental therapy for another similar group of patients for purposes of subsequent statistical study. It was obviously impossible to utilize such a procedure for a retrospective survey such as this one. Another criticism which may be brought forth by the opponents of intraspinal therapy is the assumption that other methods such as spinal drainage alone, or the introduction of unarsphenaminized serum, do as much good as the therapy we have described. Our answer to this is that in our experience such methods of treatment produced results, both clinical and serologic, which were inferior to those obtained with the Swift-Ellis technic.

In the present paper a selected group of neurosyphilitic patients were considered, namely those who were physically able to undergo intraspinal treatment because signs and symptoms of advanced phases of the disease had not been produced. In other words, intra-

spinal therapy was confined to patients who exhibited the early clinical signs of involvement of the central nervous system.

The fact that we have chosen patients who underwent treatment and observation for periods of five years or longer tends automatically to exclude many of the poor results obtained for patients with dementia paralytica and patients with the tabetic form of dementia paralytica, since these particular patients frequently die within five years after the onset of symptoms; on the other hand, many of the good results obtained for patients who had asymptomatic or meningeal neurosyphilis are excluded, since such patients disappeared from observation within this period.

The best results of intraspinal therapy were obtained for those neurosyphilitic patients who had the meningeal, asymptomatic and early tabetic manifestations of the disease. Patients who had early tabes dorsalis did decidedly better than those who exhibited signs of the advanced disease.

The poorest results were obtained for patients who had dementia paralytica. In the presence of this condition the main value of intraspinal treatment lies in postmalaria therapy if pronounced mental deterioration is not present. Intraspinal therapy is of less value than fever therapy and tryparsamide in the treatment of dementia paralytica.

The Swift-Ellis technic of intraspinal therapy in the management of some of the early manifestations of neurosyphilis is safe and the benefits gained from it by the patient far outweigh the incidence of untoward reactions to the procedure. In the present series there were only nine disturbing or potentially serious reactions in more than two thousand three hundred intraspinal treatments, and among none of these patients did permanent sequelae develop. The majority of these reactions were encountered by patients who had tabes dorsalis with evidence of involvement of the lower part of the spinal cord.

It is our opinion that treatment with malaria is more beneficial than Swift-Ellis therapy in producing arrest of the advancement of optic atrophy.

CONCLUSIONS

The indications for intraspinal (Swift-Ellis) treatment, provided the patient is in good physical condition and can tolerate the arsphenamines, may be summarized briefly as follows:

1. It is particularly of benefit for patients who have asymptomatic and meningeal neurosyphilis and for those who have early tabes dorsalis.

2. Intraspinal therapy of the Swift-Ellis type is of special value for patients who have the early manifestations of neurosyphilis when a trial with routine treatment has failed to produce clinical or serologic improvement.

3. The Swift-Ellis procedure is valuable postmalaria therapy in certain forms of neurosyphilis in which mental changes are not present.

4. When this procedure is employed, so-called foreign arsphenaminized serum may be used in cases of syphilitic cardiovascular disease with complicating neurosyphilis.

5. When the Swift-Ellis procedure is employed, a minimum of seven intraspinal treatments combined with routine therapy is desirable, although many patients do well with fewer treatments.

Contraindications to intraspinal therapy include, besides those common to the use of arsphenamine, the following: (1) patients who exhibit the clinical signs of neurosyphilis which persist in spite of adequate treatment in whom reactions to tests of the cerebrospinal fluid have become negative, (2) patients physically unfit, such as those who have advanced tabes dorsalis, (3) the presence of the signs and symptoms of advanced involvement and degeneration of the lower part of the spinal cord and (4) cases in which reactions from the treatment are more severe than those resulting from ordinary lumbar puncture.

Excellent serologic and clinical results may be obtained with treatment by a combination of intraspinal and routine therapy for patients who have certain forms of neurosyphilis. However, it is our practice to use other forms of supplemental treatment, such as fever therapy and/or tryparsamide, when satisfactory results fail to appear after a trial with intraspinal therapy.

ABSTRACT OF DISCUSSION

DR. HAROLD N. COLE, Cleveland: Drs. Kierland and O'Leary have brought out a fact that may not be well known, namely that it was Marinesco who in 1910 and 1911 first injected the serum of syphilitic patients into the same patients intradurally. Much has been written on the subject, though particularly in a period up to fifteen years ago. I wonder whether this has any significance. The writers' material is based on 2,369 intraspinal treatments given to 370 patients through the years 1924 to 1927, thus allowing prolonged follow-up study. There were reactions after 229 treatments, an incidence of 9.7 per cent, but the reaction after 200 of the 229 consisted of headache, nausea and vomiting and increased pain in the legs. The severe reactions were found more in persons with tabes dorsalis. In 5 of these they involved the bladder. In 2 transitory transverse myelitis developed, though 1 of them subsequently received further treatment without disturbance. In 1 there was meningitis, with recovery within three weeks. The results of therapy are limited to 200 patients observed for five years or more. The authors divide the evidence of neurosyphilis in the cases into asymptomatic manifestations, tabes dorsalis, the tabetic form of dementia paralytica, dementia paralytica and meningeal and meningovascular manifestations. Best results were achieved in cases of early involvement of the central nervous system—in cases of asymptomatic, meningovascular and meningeal neurosyphilis and of early tabes dorsalis. Poorer results naturally were obtained in cases of the tabetic form of dementia paralytica and of dementia paralytica. In 178 of the 200 cases treatment was started with a combination of routine and intraspinal therapy, and if there was no response then other measures were employed, particularly malaria therapy and treatment with tryparsamide. As must be expected, results in the treatment of syphilis of the central nervous system are measured in terms not of months but of years. Thus in only 4 patients with tabes dorsalis was there reversal of the condition of the spinal fluid to normal in less than a year. The longest period was eight years, and for the majority the period was one to three years. In cases of dementia paralytica the reactions were even more stubborn, and the longest period to reversal was thirteen years. Naturally it was not possible to achieve even this in all cases. Unfortunately, the authors have not found it possible to compare with other forms of therapy the treatment of a group of patients with syphilis of the central nervous system given routine and intraspinal therapy alone. Only such a report will really give an opportunity properly to evaluate its worth.

DR. HARRY M. ROBINSON, Baltimore: I am convinced of the usefulness of this method of treatment of syphilis of the central nervous system. During the early period of the use of intraspinal therapy I used this form, with serum, for almost all phases of syphilis of the central nervous system. As the

years rolled on, I gradually eliminated its use for all forms except *tubes dorsalis* and optic atrophy, as I had no good results with this treatment in cases of dementia paralytica. In cases of syphilis of the meningeal type my best results have been with the ordinary routine courses of injections of an arsenical of the arsphenamine group and a bismuth compound. I have had far better results with that than I have with intraspinal therapy. As a rule I prefer, when physical conditions permit, fever therapy in cases of uncomplicated syphilis of the central nervous system. I get much better results with that than with any other form of therapy. I believe, however, that it is preferable to start treating a patient with asymptomatic neurosyphilis with arsphenamine and a bismuth compound rather than to subject him to intraspinal therapy or fever therapy. If after a year or so there is not sufficient response one may resort to more strenuous forms of therapy. I would like to ask the authors a question which Dr. Cole mentioned. Has there been a control series of patients with syphilis of the meningeal type given just routine therapy, as it is commonly known?

DR. S. W. BECKER, Chicago: During the years that these patients were being treated I had the pleasure of administering the treatment to a great many of them. I can vouch for the efficacy of the form of therapy. When I went to the University of Chicago it was not possible to install the elaborate equipment necessary to administer intraspinal treatment safely, so that we had to try something else. We devised a method whereby after the initial treatment with sodium iodide given intravenously and soluble bismuth given six days a week for a few weeks we treated the patients, depending on whether they had early or late neurosyphilis, according to the base line schedule for the type of syphilis. After they had completed the arsphenamine phase of the therapy, instead of tapering the treatment off slowly, as is our custom, we gave these patients full doses of a bismuth compound in courses of ten weeks, only two months apart. We continued that therapy, sometimes for several years, until the reaction of the spinal fluid became negative. In an analysis of the results of this type of treatment prepared by Dr. Walsh and me and published in *THE JOURNAL*, Feb. 8, 1941, we found that our results were practically the same as those obtained by the Cooperative Clinical Group in the treatment of neurosyphilis. However, for our patients we had used collateral measures, such as fever therapy and the administration of trypanamide in a small proportion, perhaps 15 per cent, as compared with something like 65 per cent for the patients of the Cooperative Clinical Group. We feel that this type of therapy is safe, convenient for the patient and apparently as efficacious as some of the more complicated types, but it must be carried out over a long period.

DR. A. BENSON CANNON, New York: I have been using this method of treatment of neurosyphilis since 1914. The more experience I have with it the more convinced I am of its value; in carefully selected cases no other treatment can supplant it. Sometimes in a case of neurosyphilis of six months' or a year's duration in which the reaction of spinal fluid has become positive only one or at the most two or three injections of serum are required to bring the reaction back to negative; thus the amount and number of doses of arsphenamine required in the subsequent period of treatment will be appreciably reduced. As to what Dr. Cole has said concerning the complicated technic of the Swift-Ellis method, I believe that the more experience one has with this treatment the more one can simplify it and that it can in reality be made an uncomplicated routine technic. One simplification which I have used for years is to allow the patient to go home at any time from fifteen minutes to an hour after he has had the puncture. My associates and I find that by thus making the routine puncture a simple procedure of examination we are able to obtain consent to puncture many more times than we could before we adopted this practice. This is particularly true in the clinic, where we now get consent to a spinal puncture when desired in practically 100 per cent of cases, compared to about 35 per cent previously. Another simplification I have adopted is in the manner of giving the intraspinal treatment itself. Whether it is given in the office or in the clinic I allow the patient to go home at any

time from half an hour to two hours after the injection. I have never observed any serious accidents resulting from this practice. If the patients are carefully selected for this type of treatment it is safe to give the intraspinal injection in this fashion, thus doing away with the inconvenience to the patient of overnight hospitalization. One is accustomed to think of the spinal fluid as being more resistant to this type of treatment than the blood. As a matter of fact the reverse is frequently the case: giving intraspinal therapy to a patient whose blood and spinal fluid both show a strongly positive reaction will often render the reaction of the spinal fluid negative long before it has any effect at all on the blood.

DR. ROBERT R. KIERLAND, Rochester, Minn.: It must be remembered that no ideal system of treating syphilis of the central nervous system exists. This brings up the point brought out by Drs. Cole and Robinson regarding a control series. Unfortunately, few studies of any type of syphilis have adequate controls. Perhaps the only study which may be considered as such is that by Brusgaard. The ideal system would be to take 100 consecutive patients with neurosyphilis and treat them with nothing but the routine type of therapy in spite of what good or bad results may have been obtained. An additional hundred neurosyphilitic patients should receive nothing but a combination of intraspinal treatment plus routine therapy, the next hundred should receive trypanamide, the next hundred fever therapy and so on. This is manifestly impossible, as when one treats private patients one tries to obtain the best results possible with a combination of all types of therapeutic measures. It must be remembered that in the majority of instances patients who were started on a routine therapy received no other type of therapy if they obtained good results. The same practice applied to intraspinal treatment. If while receiving a combination of routine and intraspinal treatment they obtained good results, other supplemental procedures were not used. The reason that many patients received these supplemental forms of treatment was that they did not do well with the type of therapy previously given. I think that will serve to clear up the remarks of Dr. Robinson. The results pictured on the slides are only those obtained before the institution of other therapeutic methods, and the complete paper will include also the final results obtained with all types of therapy. I am familiar with Dr. Becker's and Dr. Walsh's work concerning the prolonged use of bismuth compounds but have had no experience with it. If these studies are confirmed, it is a large advance in the treatment of syphilis of the central nervous system. I hardly agree with Dr. Robinson's remark that routine treatment alone does better than a combination of intraspinal and routine therapy. Certainly that is far from the experience of the Cooperative Clinical Group. This is borne out in practically all their studies, particularly the last three dealing with asymptomatic neurosyphilis, *tubes dorsalis* and the complete paper on symptomatic neurosyphilis.

The Plight of the Best.—Five years after graduation the ablest of my contemporaries were making \$10,000 a year in practice and have continued at that level or above it. The equally able men who went into teaching or research were at \$3,000 after six years and a few have worked up to \$9,500 twenty years later. It may be replied that low salaries eliminate the incompetent. They do not. I may as well say straight out that the incompetents stick on. Low salaries may cause the money minded and the hard pressed to go elsewhere. The worst and the best stay on. One cannot pass over the incompetents as negligible. They clog the roads. But the plight of the best is truly distressing. Indeed, I could offer no excuses for what I know, but cannot reveal, regarding the struggles of some of the most eminent medical scientists in this rich country to raise and educate their none too numerous families. If you detect indignation in these remarks please remember that the best investigators in medicine are men of humility and modesty who do not know how to protect themselves in serving our highly competitive society. That seems to me society's loss and its shame.—Gregg, Alan: *The Furtherance of Medical Research*, New Haven, Conn., Yale University Press, 1941.

ACUTE HEMATOGENOUS STAPHYLO-
COCCIC OSTEOMYELITISTREATMENT WITH SULFATHIAZOLE WITHOUT
OPERATION

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Sulfathiazole, with its bacteriostatic and bactericidal properties, offers a new approach to the treatment of acute staphylococcic osteomyelitis by attacking the staphylococcus organism both in the blood stream and in the local lesion.

Up to the advent of sulfathiazole the treatment of the bacteremia or the toxemia has been directed toward supportive methods, such as infusions, blood transfusions and the use of antitoxins, as advocated by Baker and Shands¹ and other investigators. The universally accepted approach to the local lesion has been operative, varying from simple incision and drainage of the soft tissue abscess to more radical drilling or guttering of the bone. Authors are divided as to the extent and time of operation. One school, represented by such men as Hart,² Fraser,³ Robertson⁴ and Conwell and Sherrill,⁵ advocates early incision of both bone and soft tissue. Another school advocates delayed operation and then only incision and drainage of the soft tissue (Wilensky,⁶ Crossan,⁷ Green and Shannon⁸ and others). Both schools, however, have expressed the belief that some type of drainage is necessary. Attempts to combat the staphylococcus organism locally once drainage has been established have met with little success.

A review of studies of the end result of both acute and chronic osteomyelitis, regardless of the methods of treatment employed, is conclusive evidence of the inadequacy of the usual treatment of the disease. The high mortality, long hospitalization, severe deformities, secondary joint involvement, multiple operative procedures, economic loss and invalidism are grim monuments to this fact. Crossan⁹ in 1938 made an excellent survey of all the literature on osteomyelitis for a seven and one-half year period and concluded that one fact was established clearly and one fact only; namely, the disease has a poor prognosis. Slightly more than one-fifth of the patients died and nearly two fifths of the survivors were crippled. Some of those not crippled were invalids or suffered periods of recurrent invalidism because of the disease.

From the Children's Hospital.

Read before the Section on Orthopedic Surgery at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

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2. Hart, V. L.: Acute Hematogenous Osteomyelitis in Children, *J. A. M. A.* **108**: 524 (Feb. 13) 1937.
3. Fraser, J.: Acute Osteomyelitis, *Brit. M. J.* **2**: 539, 1934.
4. Robertson, R. C.: Acute Hematogenous Osteomyelitis: Analysis of Seventy-Five Cases, *J. A. M. A.* **107**: 1193 (Oct. 10) 1936.
5. Conwell, H. E., and Sherrill, J. D.: Acute Osteomyelitis in Childhood: Diagnosis and Treatment, *South. M. J.* **30**: 171, 1937.
6. Wilensky, A. O.: Acute Hematogenous Osteomyelitis: Classification of Cases of Acute Hematogenous Osteomyelitis as Determined by Therapeutic Indications, *Arch. Surg.* **34**: 320 (Feb.) 1937.
7. Crossan, E. T.: Conservative Treatment of Hematogenous Osteomyelitis, *Ann. Surg.* **103**: 605, 1936.
8. Green, W. T., and Shannon, G.: Osteomyelitis of Infants: A Disease Different from Osteomyelitis of Older Children, *Arch. Surg.* **32**: 462 (March) 1936.
9. Crossan, E. T.: Hematogenous Osteomyelitis: Collective Review of the Literature from 1932 to 1937, *Surg., Gynec. & Obst.* **66**: 176, 1938.

In the recent literature there has been a definite trend toward conservative treatment, and the following significant observations have justified this conservatism. Early operation has increased toxicity, and negative blood cultures have become positive (Dolman¹⁰). The mortality appears to be greater among patients on whom operation is done early, especially when bone is opened (Pyrall and Pain¹¹). Early operation does not appear to lessen the extent of involvement of the bone and may tend to increase destruction by disturbance of the blood supply.

Wilensky⁶ has shown that foci of hematogenous osteomyelitis may subside completely and spontaneously without going on to the stage of necrosis and sequestration; that similarly sequestered areas of bone can and do become revascularized and reincorporated with neighboring bone tissue in much the same manner as a bone graft. He likewise has expressed the belief that acute hematogenous osteomyelitis is an incident in a general bacterial infection:

In the treatment of this disease in the early stages the most important item is the general infection. The ultimate outcome, death or recovery, depends entirely on this factor, and the mortality statistics of acute hematogenous osteomyelitis in its early stages reflect accurately the mortality of general bacterial infection. When divorced from the general bacterial infection and in the absence of any fatal complications or associated lesion, the mortality of the local osseous lesion is nil.

Since the advent of sulfathiazole the literature has been voluminous in reports of both the experimental and the clinical uses of the drug. Barlow and Homburger¹² have shown that sulfathiazole has definite bacteriostatic and bactericidal effects on the staphylococcus, both in vivo and in vitro. They have demonstrated also that the life of experimental mice infected with highly virulent strains of *Staphylococcus aureus* is prolonged and that abscesses in the kidneys and other organs are prevented or healed by the use of sulfathiazole.

Repeated reports have established the fact that sulfathiazole definitely sterilizes the blood in staphylococcic septicemia, effecting a cure.¹³ Local lesions caused by the staphylococcus have also shown favorable results from internal administration of the drug.

Sulfathiazole is being used generally in the treatment of both acute and chronic osteomyelitis, but to date few reports have appeared. Dickson and his associates¹⁴ have used it both internally and locally in a series of cases of chronic osteomyelitis, with favorable results. Melton¹⁵ reported 10 cases of acute osteomyelitis in which it was used internally but in association with incision and drainage. He stated that it did not lessen the need for surgical drainage or check the progress of suppuration. It did lessen toxemia.

To date there have been no published reports of internal treatment with sulfathiazole without drainage of the local abscess. Nachlas¹⁶ has treated a series of patients

10. Dolman, E. E.: Pathogenic and Antigenic Properties of Staphylococci Toxin, *Am. Pub. Health J.* **23**: 125, 1932.

11. Pyrah, I. N., and Pain, A. B.: Acute Infective Osteomyelitis: Review of Two Hundred and Sixty-Two Cases, *Brit. J. Surg.* **20**: 590, 1933.

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13. Hamburger, M., and Ruegger, J. M.: The Treatment of Staphylococcal Septicemia with Sulfamethylthiazole and Sulfathiazole: Report of Twelve Cases, *Ann. Int. Med.* **14**: 1137, 1941.

14. Dickson, F. D., and others: The Treatment of Chronic Osteomyelitis by the Local Use of Sulfathiazole, read before the American Academy of Orthopedic Surgeons, New Orleans, 1941, to be published.

15. Melton, George: Sulfathiazole in the Treatment of Staphylococcal Infections, *Lancet* **1**: 274, 1941.

16. Nachlas, I. W.: Personal communication to the authors.

in this manner without any operative procedure and reported excellent results. His work will appear in the literature at an early date. Badgley¹⁷ has treated several patients with sulfathiazole, delayed incision and drainage with good results. He has also treated a secondary bone lesion in 1 of his cases without surgical intervention.

Since August 1940, in 8 consecutive cases of acute osteomyelitis treatment with sulfathiazole without operation has been given at the Children's Hospital. The unusual course of the disease and the abscess, contrary to all previous experience and associated with end results superior to anything that we have heretofore seen, leads us to review the 8 cases.

METHOD OF TREATMENT

The treatment here outlined should be undertaken only in a hospital, under the most competent supervision. On admission supportive treatment is given, and the pain is controlled by immobilization and the administration of mild sedatives. Oral sulfathiazole therapy is instituted immediately. The initial dose is determined by the body weight of the patient. A safe dose for

It is advisable to give transfusions of 300 to 500 cc. of whole blood every few days during the first two weeks and at less frequent intervals thereafter, depending on the condition of the patient.

The treatment of the local lesion is that of nonintervention. Wet packs have been employed, but they are of questionable value. Immobilization during the painful stage of the abscess is advised and is best carried out by posterior splinting or extension. The duration must be determined by the condition in the individual case. Obviously, for extremities with extensive involvement of bone and danger of spontaneous fracture, immobilization must be employed over a longer period of time. As a rule, however, after the abscess begins to recede, rigid immobilization should be discontinued and passive and active motion of the part should be started. This results in less atrophy and better repair. The local lesion is protected against trauma by thick dressings, as spontaneous rupture of the abscess is to be avoided.

Care after discharge from the hospital is likewise dependent on the condition in the individual case. The same methods of protection as are employed in any

TABLE 1.—Summary of Cases

Patient	Age	Sex	Onset	Cutaneous Lesion	Organism	Lesion	Blood Cultures	Abscess Cultures	Hospital Days	End Result
1. B. M.	11	♂	August 1940	Infected bite	Staph. albus	Scapula, humerus	+++	+	66	Limitation of motion of shoulder; no drainage
2. R. J.	11	♂	July 1940	None	Staph. aureus	Femur, tibia	+++	—	54	Normal function; no drainage
3. L. A.	6	♀	September 1940	Furunculosis	Not determined	Tibia	—	—	21	Normal function; no drainage
4. R. B.	14½	♂	September 1940	Furunculosis	Staph. aureus	Clavicle, femur	+	++	39	Normal function; no drainage
5. J. A.	7	♂	November 1940	None	Staph. aureus	Fibula	—	++	39	Normal function; no drainage
6. N. G.	14	♀	December 1940	Infected blister	Staph. aureus	Right ilium	++	—	65	Slight tilting of pelvis; no drainage
7. R. A.	13	♂	December 1940	Furunculosis	Staph. aureus	Left ulna	++	+	120	Limitation of motion of elbow; draining sinus of arm
8. J. B.	10	♂	February 1941	Furunculosis	Staph. aureus	Metatarsal, great toe	—	+	33	Normal function; no drainage

initial administration is 1 to 1½ grains (0.06 to 0.1 Gm.) per pound (0.5 Kg.) per day. For a child of 100 pounds (45.4 Kg.) the initial dose would be 20 grains (1.2 Gm.) every four hours. Subsequent dosage is regulated by determination of the blood level of the drug. An attempt is made to maintain the blood level at 4 to 6 mg. per hundred cubic centimeters throughout the treatment. To accomplish this, one must give the drug every four hours because of rapid excretion. An equal dose of sodium bicarbonate is given simultaneously.

Since on admission patients with acute osteomyelitis are dehydrated, liquids are immediately forced and saline solution is given intravenously. The procedure is repeated as often as necessary to maintain a normal relation of intake and output of fluids. While the forcing of liquids may lower the blood level of the drug, it is better to increase the dose than to decrease the intake of fluids. Renal complications if present are the result of crystalline deposits in the tubules of the kidney, and concentration and acidity of the urine are to be avoided. Administration of sulfathiazole is continued unless contraindicated for at least two to five weeks at full dosage. The duration of therapy is determined by the condition of the patient and the course of the disease.

other type of treatment should be used, but the problem is simplified because there is no draining sinus. Weight bearing with protection is instituted as early as the local lesion will safely permit it.

REVIEW OF CASES

Table 1 gives a summary of the data in the 8 cases reported. In 6 there was a history of some previous cutaneous infection, the most common lesion being furunculosis (4 cases). The staphylococcus organism

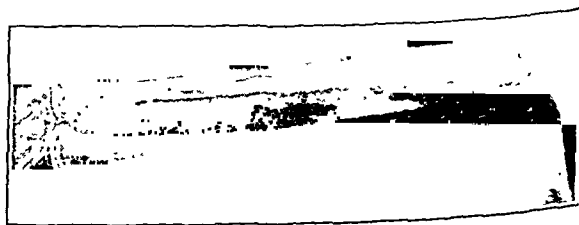


Fig. 1 (case 7).—Osteomyelitis of shaft of ulna.

was demonstrated in 7 cases either by blood culture or by aspiration of the local abscess. In case 3 no organism was demonstrated.

Repeated blood cultures were studied in all the cases. In 5 of these, cultures of material obtained at some time during the first week and a half were positive. After this period no positive reports were returned, although

17. Badgley, C. E.: Personal communication to the authors.

blood for culture was taken every few days during the hospital stay. The colony count varied from ninety per field (case 1) to three to four (case 8).

The local abscess was aspirated early for diagnosis in 5 cases, and culture of the aspirated material was reported positive. In 3 of these cases aspiration was

drain seropurulent fluid from which *Staph. aureus* could be cultured. This drainage persists, although it appears superficial and does not seem to lead to bone.

The symptoms in this series at onset were similar to the symptoms in any other group of cases of acute staphylococcal osteomyelitis. There were severe toxemia, a high temperature and swelling and pain in the extremities. In case 1 the most severe systemic reaction in the whole series occurred. There was a positive blood culture of ninety colonies per field, and the osteomyelitis was complicated with a chest condition producing material from which *Staphylococcus albus* could be cultured. The patient was treated in an oxygen tent for ten days and had the severest soft tissue involvement of the shoulder, neck and face that we have ever encountered. Any type of operative treatment was contraindicated. Considered moribund, the patient was treated symptomatically and given sulfathiazole. In the third week of treatment two small exploratory incisions were made in the skin over the scapula. No pus was encountered, and the incisions were closed with sutures. Primary healing took place, and cultures of material from this area were sterile. The favorable end result of treatment in spite of the general condition, the roentgen appearance and the local soft tissue lesions led us to treat subsequent patients with sulfathiazole without operation. Many of the other patients presented severe general and local symptoms and responded equally well.

The majority of patients showed little improvement until the second week. The temperature remained ele-

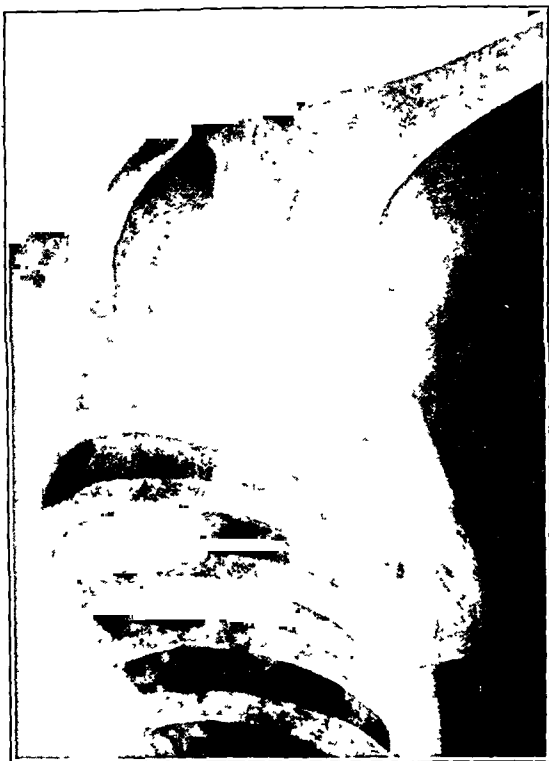


Fig 2 (case 1) —Appearance ten months after onset of osteomyelitis

repeated three to five weeks later, and the cultures were negative. The late aspirations were made after rather long administration of sulfathiazole.

Leukocytosis, the white cell count varying from 40,000 to 15,000, was present in all the cases during the early stage of the disease. In several cases there was a fall in the red blood cell count and the hemoglobin content during the second week. The urine remained normal in the whole series throughout the hospital stay. Frequent determinations of the blood sulfathiazole level were made. The highest level in any case was 14 mg. per hundred cubic centimeters (case 6). In case 3 2.8 mg. was the highest level that could be maintained. The average for the series was 4 to 6 mg. per hundred cubic centimeters during active administration of sulfathiazole.

For the first two weeks the local soft tissue lesions presented the same appearance as any other acute inflammatory abscess. Then they became less hot and tense and smaller and were less painful. In three to four weeks the inflammatory area if still present became darker and did not feel hot, and an indurated border and a soft, rubbery center developed. As time progressed, the local lesion completely disappeared and the skin took on its normal appearance.

In case 7, in which a most extensive involvement of the ulna and the forearm occurred, the local lesion remained closed for four months. There persisted over the forearm three discolored areas with soft centers. After being struck with a toy these lesions started to



Fig 3 (case 6) —Osteomyelitis of right side of ilium. appearance five months after onset.

vated for two to six weeks and in several cases was higher in the second and third weeks than in the first. Even though the temperature remained elevated this late and the local lesion was still present, the general condition and the toxemia were much improved. The patients were bright and alert and required no medication for the local lesions.

Roentgen studies made at onset in all cases followed by frequent rechecks up to the present have shown extensive bone changes. The primary bone lesion has progressed at first much as it does in similar cases in which treatment is by incision and drainage without sulfathiazole. Areas of absorption have been followed by bone proliferation and in 3 cases by definite sequestration (cases 5, 7 and 8). As time has passed the areas of sequestration in cases 5 and 7 have disappeared and have become incorporated into the substance of the ulna and of the fibula respectively.



Fig. 4 (case 6) —
End result.

In case 7 the whole shaft of the ulna was involved (fig. 1). Two months later an unusual amount of proliferation appeared, increasing the diameter of the bone. This at first cast a faint shadow but later became more calcified and gave the appearance of an involucrum. At the end of six months a decrease in the size of the bone occurred, with reestablishment of a more normal contour. In case 1 enormous bone proliferation involved the whole bone (fig. 2), and this has persisted, although it has taken on more nearly the appearance of normal bone. In case 4 there was little bone proliferation in the clavicle, and studies of the end results reveal a well healed lesion. In case 6 the disease of the humerus has progressed like any other osteomyelitis (figs. 3 and 4) except that the involvement is not as

extensive as that usually found. In case 3 the disease was confined to the upper end of the tibia and after eight months has almost completely disappeared.

In cases in which more than one bone was involved little bone proliferation is observed in the secondary lesion, and after six to eight months the lesions are well healed. In case 2 there was a secondary lesion of the epiphysis of the femur and of the patella, but healing appears to have taken place.

End results are considered from the standpoint of the general condition and the local lesions. The excellent physical condition of the patients is impressive. Asymptomatic after two to three months, they have the appearance of normal, healthy children, have gained weight and have normal blood counts. Short hospitalization and immobilization, with early return to normal activity without plaster casts or draining sinuses, have produced none of the usual appearances of the septic, anxious patient who has been operated on for osteomyelitis.

The end results of treatment of the local lesion have been most satisfactory to date. In only 2 cases has any drainage developed. In case 1, eight months after onset a serous drainage developed in the site of the incision in the skin over the scapula. This was superficial and persisted for only two weeks. Culture of material obtained from this area was not positive. In case 7 the lesion is still draining after a direct trauma to the region of the ulna, and culture shows *Staph. aureus*. In 6 of the 8 cases there has been an increase in size of the part affected. This is evident both to inspection and by measurement but is becoming less apparent as time goes on. Only 2 patients have shown

any limitation in function. Patient 1 (fig. 2) has limitation in rotation of the shoulder of about 50 per cent. Abduction of the shoulder is limited to 45 degrees. There is also definite muscular weakness of the shoulder girdle. Patient 7 at this time has almost complete limitation in pronation and supination of the forearm, and flexion and extension of the elbow and the wrist are diminished about 50 per cent. Patient 6 has slight tilting of the pelvis. The progress of the osteomyelitis, data on sulfathiazole therapy and the end result in case 5 are shown in figures 5, 6, 7 and 8.

Practically no atrophy has resulted in the region of the local lesion, and the color and the character of the skin have returned to normal. There appears to be no evidence of induration except in patient 7, whose lesion is draining.

Of the 8 patients treated, only 1 remains in the hospital at this time. The longest hospital stay has been one hundred and twenty days and the shortest twenty-one days, with an average of fifty-four days for the series. With increasing experience in the treatment of the disease we believe that the hospital stay can be considerably reduced. Seven patients have returned to school. Two are using crutches for protection, 1 of whom has a light foot cast to prevent weight bearing.

COMPLICATIONS

Children tolerate sulfathiazole well. Fortunately acute osteomyelitis occurs mostly in children and young adults. To date we have had no complication which has made it impossible to carry out the required treat-

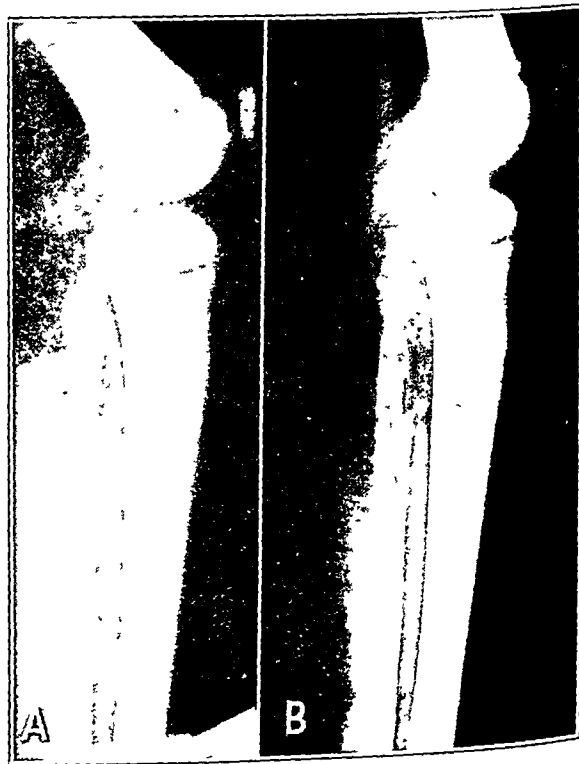


Fig. 5 (case 5) —Progress of osteomyelitis. A, seven days. B, two to three days after onset.

ment. In 2 cases a cutaneous eruption appeared simulating erythema nodosum. In 1 of these the drug was withdrawn for two days, the condition cleared up and use of the drug was resumed. In the other the drug was not withdrawn and in three days the cutaneous

condition disappeared. There were no renal complications. Accurate studies of the intake and output of fluid were made, and the amounts remained well within normal range in all cases. In case 7 after prolonged use of the drug over several weeks conjunctivitis developed, necessitating discontinuance. In several cases some nausea was encountered during the first few days but never was a serious problem. In 2 cases we found that the temperature remained elevated until administration of the drug was discontinued. This may be true oftener than is realized. We do not hesitate to discontinue administration of the drug at any time when in doubt as to a complication. Few serious complications of the drug's use have been reported. Long

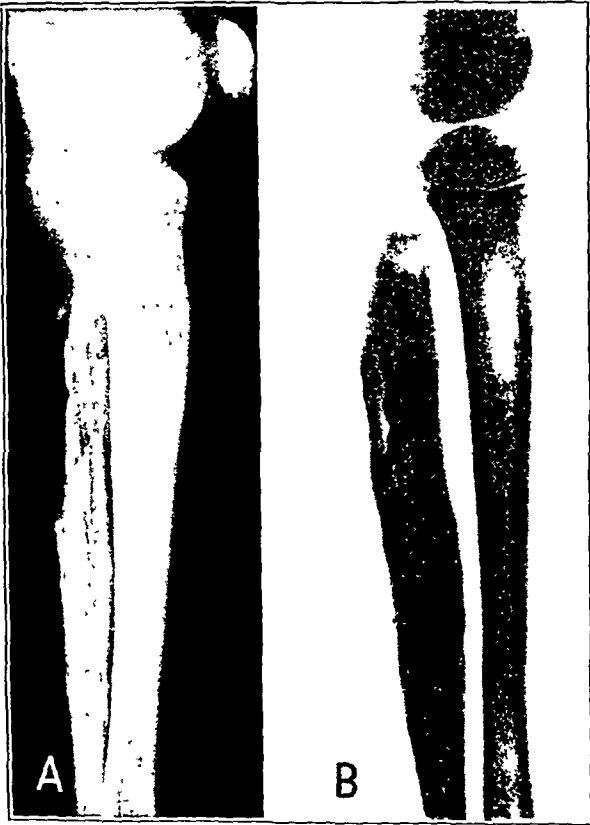


Fig. 6 (case 5).—Further progress: A, six weeks, B, six months after onset.

and his associates¹⁸ have described in detail the complications produced by sulfathiazole and its toxicity as compared with that of sulfapyridine and sulfanilamide.

COMMENT

Osteomyelitis is primarily a bacteremia, and the bone lesion is secondary. Nussbaum¹⁹ showed that the terminal arteries at the metaphysis are dilated, forming a so-called venous lake. Here stasis can occur and bacterial masses as large as 20 microns can lodge. With the slowing of the blood stream, lessened phagocytosis occurs and favorable conditions for an inflammatory process arise. This extends to the periosteum and later, after a certain amount of elevation, breaks through into the soft tissue. If undisturbed surgically the abscess ruptures spontaneously, creating a sinus directly

to the bone. When incision and drainage are done, either early or late, the same situation is artificially produced. When operation is used in a case of acute osteomyelitis it follows that there must be some disturbance in the blood supply to the bone and the soft

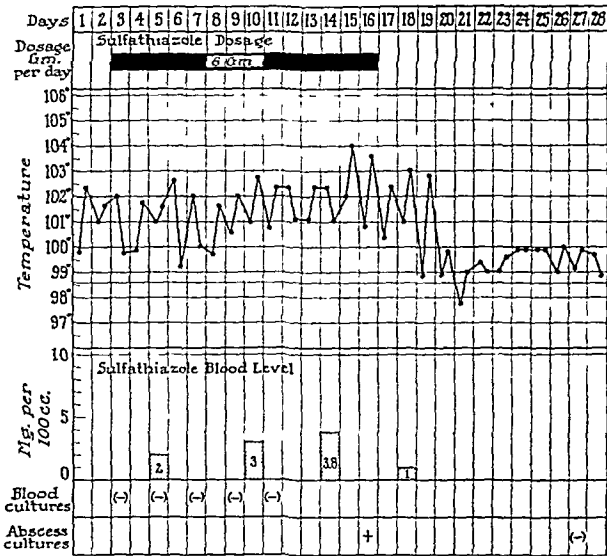


Fig. 7 (case 5).—Clinical course in hospital.

tissues as a result of the operation. Also, when continued drainage or packing is employed in the after-treatment there is sure to be a mixed infection involving the whole inflammatory area. It is difficult to evaluate

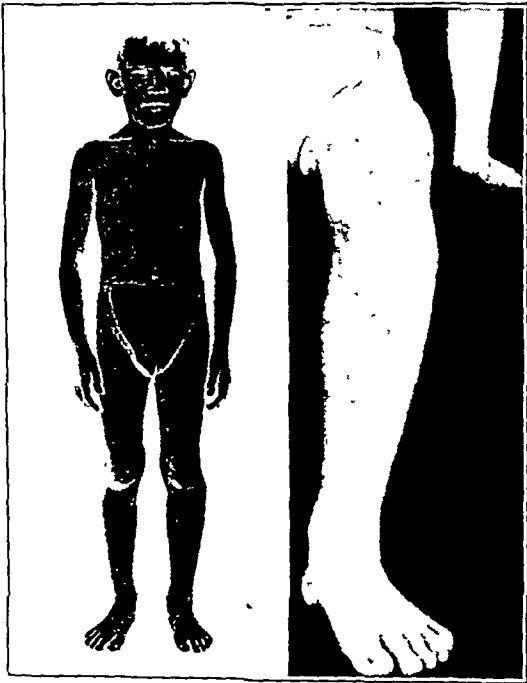


Fig. 8 (case 5).—End result

how much these two factors have affected the acute and chronic course of the disease in the past.

It has been shown that when sulfathiazole is administered there is a definite blood concentration which can be maintained at a desired level. It has also been shown that material aspirated from an abscess of acute

18 Long, P. H.; Haviland, J. W.; Edwards, L. B., and Bliss, E. A.: The Toxic Manifestations of Sulfanilamide and Its Derivatives, J. A. M. A. 116: 364 (Aug. 3) 1940.
19 Nussbaum, A.: Beziehungen der Knochengefäße zur akuten Osteomyelitis, Zentrabl. f. Chir. 49: 700, 1922

osteomyelitis treated by sulfathiazole will show a concentration as high as if not higher than that of the blood taken at the same time. We think it can be assumed from these observations that there is a diffusion of sulfathiazole into the whole inflammatory area as well as into the blood. The maintenance of a sulfathiazole concentration in both the blood and the inflammatory area would attack the staphylococcus organism wherever it might be.

It is our opinion that in cases of acute osteomyelitis sulfathiazole can eventually sterilize both the blood and the local lesion. We have shown on several occasions that culture of material aspirated early is positive for the staphylococcus and that culture of material aspirated late is negative. As further evidence, there came under our observation a case not included in this series in which incision and drainage of an abscess over the scapula was made after four weeks of sulfathiazole medication. No pus was found, but a yellow serous fluid was present. There was evidence of a healing process, a copious blood supply and excessive granulation tissue. Cultures of material from this abscess were negative.

It appears that in our series the earlier administration of the drug was started after the first symptom was recognized the shorter was the period of elevation of the temperature and the less the involvement of bone

not be drawn, but there are evident improvements over previous end results. Only ten months have elapsed since the onset of acute osteomyelitis in the first patient treated, and what the ultimate result will be after one, two or ten years cannot be predicted. Comparison of these patients with any other series of patients, however, shows striking differences. There has been no mortality; hospitalization and disability have been shorter; there have been no draining sinuses except late in 1 case; no operations have been performed, either primarily or secondarily; deformities and limitation in motion have been minimal. The patients are not invalids and with the exception of 1 still under treatment are carrying on normal activity and attending school.

The most revolutionary part of the treatment suggested in this paper is the handling of the local lesion without operation. Surgeons trained under the precept and surgical principle "Where there is pus, drain" find it extremely difficult to refrain from surgical intervention. However, by waiting we have repeatedly seen painful, red, hot, fluctuating abscesses, from which pus which produced positive cultures could be aspirated, change into painless, pale, soft, doughy areas which yield negative cultures and finally completely disappear.

The second week is the most difficult time to pass without resorting to surgical procedures. The use of sulfa-

TABLE 2.—Data on Sulfathiazole Therapy

Patient	Age	Sex	Lesion	Onset of Symptoms	Beginning of Therapy	Daily Dose	Days of Treatment	Blood Level, Mg. per 100 Cc.	Appearance of Normal Temperature
1	11	♂	Scapula, humerus	8/17/40	5th day	6 Gm.	45	2.5 to 7	42d day
2	11	♂	Femur, tibia	7/10/40	3d day	6 Gm.	14	5.5 to 5.8	14th day
3	6	♂	Tibia	9/17/40	13th day	6 Gm.	41	4.4 to 5.7	14th day
4	14½	♂	Clavicle, femur	9/28/40	3d day	4 to 10 Gm.	37	3.3 to 8.3	30th day
5	7	♂	Fibula	11/ 5/40	8th day	6 Gm.	14	1.0 to 3.8	20th day
6	14	♂	Ilium	12/20/40	24th day	6 Gm.	45	3.5 to 14	50th day
7	13	♂	Ulna	11/ 4/40	10th day	3 Gm.	14	1.7 to 4	21st day
8	10	♂	Metatarsal	2/15/41	10th day	3 Gm.	34	2.3 to 9	13th day

(table 2). We have observed in the last ten months 3 patients with positive blood cultures who had tenderness and pain over the long bones. They were given sulfathiazole within two or three days after the onset of symptoms. No local abscess occurred, and there was no roentgen evidence of involvement of bone. Obviously these were not included in our series, but we feel it is possible that these 3 patients had acute osteomyelitis which because of the early administration of the drug did not follow the usual course.

From the study of the roentgenograms in this series it does not appear that the extent of the involvement of bone has been lessened. On the contrary, the typical degenerative changes of acute osteomyelitis have been followed by sequestration and the formation of an involucrum with ultimate excessive bone proliferation. As time has elapsed this proliferation has decreased, much as does a callus about a fracture. Regardless of how soon the temperature returned to normal or how soon the drug was given after the onset of the disease, these bone changes have occurred. We agree with Long,²⁰ Wilensky and other investigators that the sequestrums if sterile become revascularized and act as a bone graft.

The disadvantages of previous methods of treatment for acute osteomyelitis have been a high mortality, long hospitalization, persistent drainage, multiple secondary operations, deformities and invalidism.

Our series of patients treated by sulfathiazole without operation is not large, and too many conclusions should

thiazole produces no immediate, spectacular results. The bacteremia and toxemia of the patient will improve rapidly, but the elevation of temperature will continue, and there may be at first an apparent increase in the abscess. Continued elevation of the temperature and an increase in the abscess during the second week are not an indication for surgical procedures, however.

We object to incision and drainage with the use of sulfathiazole because the blood supply to the bone and the surrounding tissue is disturbed, interfering with the diffusion of the drug. With a draining sinus it is impossible to maintain a high concentration of sulfathiazole. Operation inevitably is followed by secondary infection through the draining sinus, producing the same set of conditions so objectionable in the older methods of treatment. The goal of this treatment of staphylococcal osteomyelitis by sulfathiazole without operation is the sterilization of both the blood and the local lesion. If that can be accomplished the bacteremia and toxemia will be controlled and repair in the bone and soft tissue will proceed normally.

CONCLUSIONS

1. In 8 cases of acute staphylococcal osteomyelitis in which treatment with sulfathiazole without operation has been given the end results after 10 months appear to be better than results obtainable by other methods.
2. The bacteremia, as evidenced by positive blood cultures, was controlled by the administration of sulfathiazole without incision and drainage of the local abscess.

²⁰ LONG, P. H.: Personal communication to the authors.

3. Abscesses have occurred of which cultures at first were positive for staphylococci but after sulfathiazole administration were negative.

4. Acute fluctuating staphylococcal abscesses have completely disappeared without incision and drainage.

5. Sulfathiazole does not appear to decrease the involvement of bone in primary lesions. In some cases there has been an increased proliferation.

6. Secondary bone lesions show fewer changes and return more quickly to normal appearance.

7. Sequestration may occur and when it does appears to act as a sterile bone graft.

8. There were no deaths in the series.

9. Treatment by this method must be instituted in a much larger series of cases and a longer period must elapse before final evaluation of its merits can be ascertained.

AUTHORS' NOTE.—Since the presentation of these eight cases in June, additional patients have been treated without operation with similar results. These include two cases of septic arthritis of the hip with bone changes. There have been no recurrences in any of the cases, and seventeen months has elapsed since the first case was treated.

407 Ohio Building.

ABSTRACT OF DISCUSSION

DR. CLARENCE H. HEYMAN, Cleveland: I have had no experience with this method of treatment as described by Drs. Hoyt and his collaborators. This is further evidence of the trend toward conservative treatment of acute osteomyelitis. It is difficult to keep hands off when we have been brought up on the axiom that where there is pus surgical drainage is required. Even with simple bone drilling it has been my experience that the progress of the disease and bone destruction with sequestration continue. Dr. Greene of the Children's Hospital of Boston not long ago gave us courage to delay any sort of operative treatment in very young children until the formation of a localized abscess. However, we recognize that in infants the infecting organism as a rule is the streptococcus rather than the staphylococcus. The authors now go still further in keeping hands off, but with the addition of sulfathiazole. They are to be congratulated on their courage. After studying the material in their exhibit I have been sufficiently impressed to adopt this method at least for a trial.

DR. CARL E. BADGLEY, Ann Arbor, Mich.: In February I showed Dr. Hoyt a case of osteomyelitis of the ilium associated with a pyarthrosis of the hip, which was treated by our usual procedure with incision and drainage of the involved area, with drainage of the abscess of the iliac fossa and drainage of the pyarthrosis, followed by sulfathiazole, with the wound kept open by petrolatum gauze. There was a prompt dropping of temperature. The child convalesced rapidly, so that an early secondary closure with sulfathiazole in the wound was followed by healing of the wound and with excellent range of motion in the hip joint. This child has an excellent hip. He has no drainage. The wound has healed and is doing very well. This has been our standard method of treatment for acute hematogenous osteomyelitis. The authors have presented something that should not be considered as a proved method of treatment but something that should be utilized from an experimental point of view. We should have an open mind and if possible see if this is not a good method of treatment. I feel convinced, as Dr. Key does, that the open operation plus the local implantation of sulfathiazole is a good procedure. Can we get away from that procedure? Can we, by this oral administration, have these patients get along without the unsightly scars? I don't think that Dr. Hoyt and his co-workers have proved that yet. They have proved that the 8 cases in which they operated did. The cases we have presented have done quite well, but that is not proof that patients can be treated for acute osteomyelitis by this method successfully in large numbers.

DR. LENOX D. BAKER, Durham, N. C.: In certain strains of staphylococcus, one or more of the sulfonamide drugs may be

specific. Recently Miss Mary Poston of our bacteriology department ran *in vitro* determinations on the effectiveness of the sulfonamides on fifty-seven strains of staphylococcus. The studies were made on broth cultures with various concentrations of the drugs up to 10 mg. I am aware that *in vitro* studies will not tell us all we want to know, but they do help in determining the susceptibility of the organism. Of the fifty-seven strains, twenty-eight were not affected by any of the drugs; twenty-nine were affected by one or more of the drugs, but only eight of the twenty-nine were affected by what we took as a maintainable blood level of sulfathiazole for an average person, that is, 5 mg. per hundred cubic centimeters. Of the eight strains affected by sulfathiazole, four were affected also by one or more of the other sulfonamides. Seven of the 8 cases which Drs. Hoyt, Davis and Van Buren have presented came from the same locality and their infections occurred between August 1940 and February 1941. Of the 7, 6 had some kind of cutaneous lesion. Could these patients have had a common infection of staphylococcus which was susceptible to sulfathiazole? If so, naturally one would expect the results which have been shown. My associates and I have treated 15 cases of staphylococcal septicemia with sulfathiazole. In some of the cases the results have been most satisfactory but evidently not all strains of this organism are affected by the sulfonamides. As to incision and drainage interfering with the blood supply, the thing that makes the staphylococcus such a potent organism is its toxin, which has four major actions: it coagulates plasma, it necrotizes tissue, it destroys young leukocytes and it hemolyzes red cells. We all have had the same experience in operating on acute osteomyelitis. As we make our incision there are a few skin bleeders, but the remainder of the tissues have no real capillary bleeding, as the plasma is coagulated. Dr. Key states that when he makes sulfathiazole determinations on the pus it usually runs somewhere less than 50 per cent of what the concentration is in the blood, so like Dr. Key I feel that it is a good idea to drain the abscess and put the sulfathiazole in the wound.

DR. FREDERICK A. JOSTES, St. Louis: Dr. Alexis F. Hartman, professor of pediatrics at Washington University School of Medicine and chief at St. Louis Children's Hospital, has treated acute osteomyelitis with chemotherapy for a period of two years. It was my privilege to see most of these cases through the entire process. I have also treated some adults. It is my belief that the results obtained by judicious administration of the sulfonamide drugs locally and by mouth with early incision, when aspiration fails to define the organism causing the infection, are as good both roentgenologically and in the course of the illness as they are in those cases in which incision is not made and that these cases afford less hazard to the patient and worry to the doctor. We have a rather large proportion of cases in which *Streptococcus hemolyticus* and not the staphylococcus was the cause. Local application of the necessary drug was made after incision as well as other forms of administration to keep up the blood concentration sufficiently long not only to stop the spread of infection but to prevent recurrences, which are so frequently seen because the drug in small doses was not given over a sufficiently long period of time after the temperature and symptoms subsided. At no time were bones drilled or was the cortex broken surgically. Our x-ray results are not very different from those of Dr. Hoyt and his co-workers. Sclerosing was noted in most of the cases. In my own cases I incised early—early meaning when we got the cases within thirty-six or forty-eight hours—the drug was put into the area as well as given by mouth. We irrigated many of the old abscesses, and in many cases even though the temperature had been normal for some time the abscess was not sterile until after irrigation with the drug solution.

DR. WALTER A. HOYT, Akron, Ohio: We were impressed with the pathologic condition in 1 case which was seen simultaneously with the first case treated. This case, one of osteomyelitis of the scapula, had been treated by sulfathiazole without operation for four weeks before admission. The patient was afebrile and asymptomatic and examination showed a dough-like swelling over the scapula. Incision and drainage were done but pus was not encountered. There was present a serosanguineous fluid, and it had the appearance of granulation tissue with a copious blood supply. Culture from this area was negative. We have encountered many men this week in our exhibit who have been

working with sulfathiazole. We have had a good cross section of what is going on over the country in this work. It has been interesting to hear a description of the pathologic condition found when operation has been performed late in the disease. Dr. Nachlas of Baltimore has treated quite a series of cases in the manner we have suggested without operation. Dr. Perrin Long feels that we are justified in continuing with this type of treatment. It is going to take men like Dr. Baker and a great deal of investigative work to stabilize the method that is to be followed as far as osteomyelitis is concerned. Dr. Key said he knew a patient who had died after sulfathiazole treatment. I have seen many patients die after operation, and I believe that many of them have died because they were operated on too early. The most convincing part of the whole treatment is the appearance of the patients. They are healthy and have returned to school and normal activity. They have no draining sinus, no atrophy, no loss in range of motion, no pain and no "smell." We are going to continue conservatively. We want to see what these cases are going to do after one year, two years, three years and longer after onset. We do not expect 100 per cent results. We expect that in some of these cases drainage will occur. We are going to report on these cases later. If any physicians treat any cases of osteomyelitis in the manner described by us, we would appreciate hearing from them. Dr. Van Buren, our surgical resident at Children's Hospital, is responsible largely for starting this work, and Dr. Roberts and the other members of the staff made it possible for us to carry it on.

SPONTANEOUS PNEUMOMEDIASTINUM IN THE NEWBORN

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AND

MEYER M. CUTLER, M.D.

CHICAGO

It has been stated that more than one third of all deaths of infants occur during the first two weeks of life.¹ Asphyxia and atelectasis are listed second only to prematurity as the cause of death in the neonatal period.¹ Few symptoms are the source of more concern to the pediatrician than dyspnea and cyanosis in the newborn infant. In many instances, although definite abnormal physical signs in the heart and lungs are not elicited, a diagnosis of congenital atelectasis is made. In some cases the symptoms become progressive and lead to death despite therapeutic measures such as clearing of the air passages, administration of oxygen, stimulation and blood transfusions. Many physicians when confronted with dyspnea and cyanosis in the newborn have had a feeling of inadequacy from the aspect both of accurate diagnosis and of adequate treatment.

This sense of inadequacy can be relieved in part by recognizing spontaneous pneumomediastinum as a possible cause of these alarming symptoms, by diagnosing it when it is present and by instituting appropriate treatment. It is hoped that the description of the diagnostic and therapeutic procedures will serve to prevent some of the tragic deaths in the neonatal period.

Cases of pneumomediastinum or mediastinal emphysema in the newborn have been described before, but the

reports have been few and their real import not recognized. In 1928 Stransky² reviewed the literature of pneumomediastinum and discovered that as early as 1853 Guillot³ had reported 2 cases of the condition in the newborn, the diagnosis in both having been made at autopsy. We have been able to find reports of only 8 additional cases since that time: 2 cases reported by Schuler⁴ and 1 each by Kirchgessner,⁵ Faber,⁶ Rosenblum,⁷ Poeck,⁸ DeCosta⁹ and Fisher.¹⁰

No mention of the syndrome is made in general pediatric textbooks or treatises on the newborn in common use. Failure to recognize the condition would seem to be due to the fact that an adequate clinical description of the syndrome and a recognition of its importance have been lacking. Recent animal experimentation by C. C. Macklin¹¹ and by Fisher and Macklin¹² and a description of the syndrome in adults by Hamman¹³ have served to bring the subject to the attention of the medical profession once again. None of the reports which we have found have stressed sufficiently the pathognomonic appearance of the lateral roentgenogram,¹¹ and as far as we could determine no one has ever employed simple therapeutic aspiration.¹⁵ It is these measures, essential for diagnosis and therapy, that we wish to stress most in our presentation.

In March 1940 we observed our first case of mediastinal emphysema in the newborn infant, and it was the dramatic result obtained in this instance that prompted us to look for more cases and to present this report.

The patient was a boy weighing 9 pounds (4.1 Kg.), born by normal delivery at the Michael Reese Hospital. He required no resuscitation at birth, his cry was good and there was no dyspnea or cyanosis. About thirty hours after birth he suddenly became dyspneic and cyanotic. Examination disclosed the following essential features: Severe cyanosis was present, with distention of the veins of the neck. The respiratory rate was more than 130 per minute. The heart tones were distant, and no murmurs could be heard. No abnormal breath sounds could be made out, although there was some suppression of sounds over the posterior portion of the chest. There was no subcutaneous emphysema and no bulging of the precordium.

The infant was placed in a Hess oxygen bed, and stimulants were administered. An emergency roentgenogram showed, in the posterior-anterior view (fig. 1), distortion of the cardiac

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12. Fisher, J. H., and Macklin, C. C.: Pulmonic Interstitial and Mediastinal Emphysema, Am. J. Dis. Child. 60: 102 (July) 1940.

13. Hamman, Louis: Spontaneous Mediastinal Emphysema, Bull. Johns Hopkins Hosp. 64: 1 (Jan.) 1939.

14. Andrus, P. M.: A New Method for the Radiographic Exploration of the Mediastinum and Concealed Portions of the Pulmonic Fields, Radiology 23: 97, 1934.

15. Complex procedures for the relief of mediastinal emphysema have been described but because of their unnecessary complexity would seem inadvisable. These may be found in:

Tiegel, M.: Ein einfaches Verfahren zur Bekämpfung des Mediastinal-Emphysems, Zentrbl. f. Chir. 38: 420, 1911, and Fürstenberg, A. C., and Yglesias, Louis: Mediastinitis: A Clinical Study with Practical and Anatomic Considerations of the Neck and Mediastinum, Arch. Otolaryng. 25: 539 (May) 1937.

From the Pediatric and Roentgenologic departments of Michael Reese Hospital.

Read before the Section on Pediatrics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

Dr. Gumbiner is associate attending physician of the Children's Division, Cook County Hospital, and formerly was resident physician of the Sarah Morris Hospital; Dr. Cutler is resident roentgenologist, Michael Reese Hospital.

The following physicians gave permission to include in this report cases from their private and ward services at Michael Reese Hospital: Drs. Philip Rosenblum, Arthur Abt, Carl Cohen and Emanuel Padnos. Dr. Henry G. Poncher permitted inclusion of the case from the tuberculous service of the Cook County Hospital.

Holt, L. E., and McIntosh, Russell: Holt's Diseases of Infancy and Childhood, ed. 11, New York, D. Appleton-Century Company, Inc., p. 56.

contour, with apparent displacement of the upper part of the heart shadow and of the mediastinal structures to the right. There was an area of radiolucency just to the left of the mediastinum in the region of the second to third intercostal spaces, and there was some increased density in the upper part

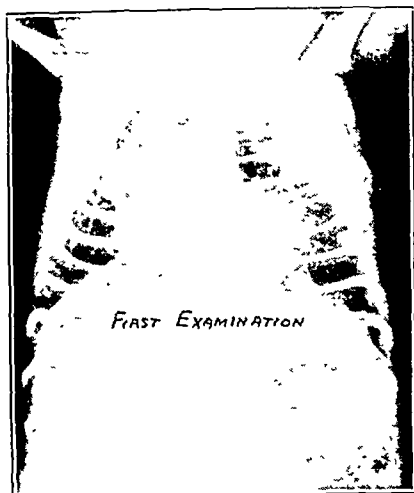


Fig. 1 (case 1).—Posterior-anterior view of the chest showing bilateral radiolucent shadows just lateral to the margins of the superior mediastinal density. These represent pools of air in the anterior mediastinal space. The cardiac shadow is suggestively abnormal in size and configuration. The heart and the superior mediastinal structures are partially displaced to the right. The upper areas of the lung fields have the appearance of either pulmonary congestion or patchy atelectasis, while the lower areas of the lung fields are hyperaerated.

of the right lung field. A lateral view (fig. 2) taken at the same time showed a distinct area of radiolucency beneath the sternum apparently displacing the heart and the mediastinal structures posteriorly. Study of the second film established the diagnosis of pneumomediastinum. During the succeeding twenty-four hours the condition of the infant became progressively worse, and a new roentgenogram showed some increase in the amount of mediastinal air. At this time the infant's



Fig. 2 (case 1).—Lateral view demonstrating sharply delineated shadows of encapsulated air in the anterior mediastinum just behind the posterior surface of the manubrium and the body of the sternum. Another globule of air is present in the region of the suprasternal notch. The shadows of the heart and the superior mediastinal structure are crowded and displaced posteriorly because of increased mediastinal pressure. Note the striking appearance in this view as compared with the posterior-anterior view (fig. 1).

condition seemed critical, and after consultation it was decided to attempt aspiration of the air.

A 21 gage needle attached to a 20 cc. Luer syringe was inserted into the third left interspace 1 cm. to the left of the sternal border and directed medially, parallel to the inferior

surface of the sternum. There was a sudden expulsion of the plunger of the syringe to the 6 cc. mark, indicating the release of air under pressure. Within five minutes there was a dramatic change in the baby's condition. The color became pink, the respiratory rate dropped to about 100 per minute and the infant started to cry and to move about in his bed. A roentgenogram taken ten minutes after aspiration (fig. 3) showed that approximately 70 per cent of the air had been removed. Within three days the infant was clinically well, and roentgenograms showed complete disappearance of air.

The diagnosis in this case was made because lateral roentgen examination was done. As this procedure is not commonly carried out in the examination of the newborn it was felt that we might have been missing the diagnosis in a certain percentage of cases. Proof that we had been doing so was obtained when 3 additional cases were discovered during the next four months. In 2 of these the symptom was slight dyspnea. Enlargement of the thymus gland was suspected. The diagnosis of pneumomediastinum in both instances was obvious from lateral roentgenograms. In the third case there were moderate dyspnea and cyanosis, with some bulging of the precordium, absence of cardiac dullness and distant heart tones. The clinical impression of pneumomediastinum was substantiated by roentgenograms (figs. 4 and 5). Successive roentgenograms in this case were of great interest, as they showed an increasing mediastinal accumulation of air and finally spontaneous pneumothorax coincident with clinical improvement and evidence of reduction in mediastinal emphysema.

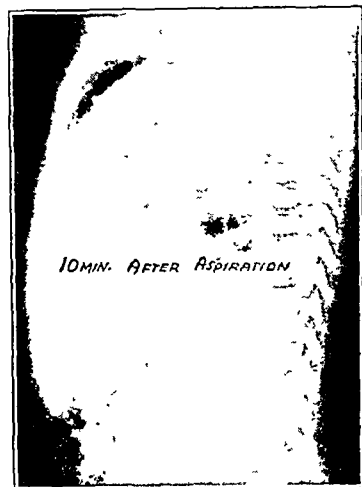


Fig. 3.—Lateral projection made immediately after therapeutic substernal aspiration. The air in the anterior mediastinum is now considerably diminished. Dramatic clinical improvement occurred within five minutes after aspiration.

It is interesting to speculate on the possibility that spontaneous pneumomediastinum may play a part in the production of types of spontaneous pneumothorax. One of us (B. G.) recently had an opportunity to observe a patient in the service of Dr. Henry G. Poncher, at the Cook County Hospital, Chicago, a 6 month old infant who had tuberculosis, in whom there developed pneumomediastinum and, subsequent to an increase in the amount of mediastinal air, spontaneous pneumothorax.

Davis and Stevens¹⁶ reported that in 6 of 702 consecutive newborn infants the presence of spontaneous pneumothorax was proved by roentgenograms, an incidence of approximately 1 per cent. If pneumomediastinum was the precursor of pneumothorax in most instances one might expect an incidence of mediastinal emphysema of more than 1 per cent. as obviously pneumomediastinum does not lead to pneumothorax in all cases.

16. Davis, C. H., and Stevens, G. W.: Value of Routine Radiographic Examination of Newborn Based on Study of Seven Hundred and Two Consecutive Babies. *Am. J. Obst. & Gynec.* 20: 73, 1930.

MECHANISM OF PRODUCTION

Spontaneous pneumomediastinum has been shown to result from pulmonary alveolar rupture (fig. 6) with subsequent passage of air through the interstitial tissue of the lung to the mediastinum. Macklin's¹¹ experimental work, done chiefly on cats, has demonstrated this mechanism conclusively. He showed that, when overdistention of a portion of the lung was artificially induced, alveolar rupture occurred, with the passage of air along the vascular sheaths to the mediastinum. It follows, therefore, that any condition which would tend to produce overdistention of a portion of the lung might result in mediastinal emphysema. The delicacy of structure of the lung of the newborn infant, and especially that of the premature infant, would seem to be a definite predisposing cause.

PATHOLOGIC CHANGES

Clinical and experimental work has shown that air in the mediastinum may extent upward to produce subcutaneous emphysema of the neck, may extent downward through the aortic hiatus to the retroperitoneal space and then, by rupture of the peritoneum produce pneumoperitoneum; or may rupture through the mediastinal pleura to produce pneumothorax (fig. 7). DeCosta⁹ reported a case in which mediastinal emphysema, subcutaneous emphysema, pneumoperitoneum and pneumothorax all were present. In addition, a patient may have subcutaneous emphysema of the chest and the abdominal wall, interstitial emphysema of the uninvolved portions of the lung, pneumoprecordium or subcu-

taneous emphysema of the groin and thigh.

If the air remains in the mediastinum and is under tension, various changes due to pressure on the surrounding structures may occur. The heart, great vessels, trachea, bronchi, lungs and vagosympathetic plexus all may be affected. Jehn and Nissen¹⁷ have shown that no symptoms are evident until the intramediastinal pressure reaches zero. They found that as the pressure increases on the positive side changes occur rapidly and proceed as follows:

At first respirations become increased and shallow. Soon there is a

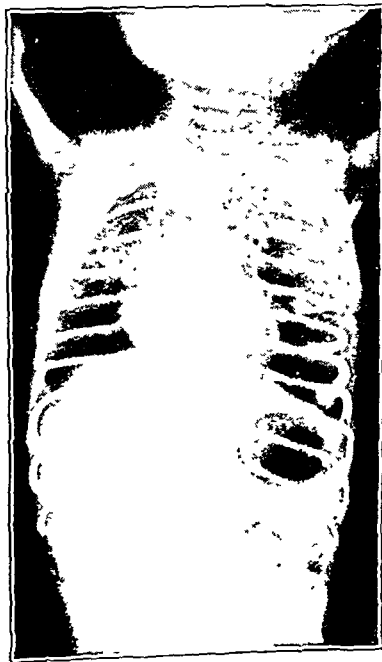


Fig. 4 (case 4).—Posterior anterior projection. There is partial pneumothorax on the left side. Note the bilateral lateral to the margins of the mediastinal air.

drop in blood pressure. The pulmonary and systemic veins are the first affected, because of their elastic, easily compressed walls. By compression of the

systemic veins the return flow of blood to the right auricle is diminished, and at the same time compression of the pulmonary veins causes diminution of the flow into the left auricle. There thus results congestion of the peripheral veins and of the lungs. The latter is an early sign and explains the dyspnea. The



Fig. 5 (case 4).—Lateral projection. There is encapsulated air in the anterior mediastinum subternally, and pneumomediastinum is present. Note the striking appearance as compared with the posterior anterior view. Bulging of the precordium is clearly evident.

direct effect of compression on the trachea and bronchi and even the lungs themselves seems to be only a small factor in the production of dyspnea. The air in the mediastinum displaces the heart downward and posteriorly, so that the heart tones are apt to be distant and the percussion note over the heart tympanitic. Air over the heart may give rise to a peculiar crackling sound, synchronous with systolic contraction. This sound has been stressed as being of diagnostic value in the adult.¹⁷

From the foregoing discussion it would seem logical that many of the conditions mentioned might be ameliorated if spontaneous decompression of the mediastinum resulted with the formation of pneumothorax, subcutaneous emphysema or pneumoperitoneum. It also seems obvious that if spontaneous decompression did not occur and symptoms became alarming therapeutic decompression would be indicated.

SIGNS AND SYMPTOMS

Mediastinal emphysema in the newborn usually occurs during the first days of life. The condition manifests itself by respiratory and circulatory distress. Respirations become rapid and shallow, and cyanosis appears. Distention of the peripheral veins occurs, usually seen most easily in the neck. Heart tones are often distant, and one may hear a crackling sound synchronous with the heart beat. Occasionally one may note bulging of the precordium. Percussion fails to elicit cardiac dullness. If spontaneous rupture occurs one may feel subcutaneous emphysema or obtain signs of pneumothorax.

17. Jehn, W., and Nissen, R.: Pathologie und Klinik des Mediastinal-emphysems, Deutsche Ztschr. f. Chir. 206: 221, 1927.

ROENTGEN DATA

Pneumomediastinum in the newborn may be suspected clinically, but the diagnosis is established definitely by roentgen examination.

The posterior-anterior view may reveal globules of air just outside what are usually considered the lateral margins of the superior mediastinum (figs. 1 and 4). The air shadows are extrapleural. If rupture through the mediastinal pleura occurs, pneumothorax becomes evident.

The lateral projection offers the most conclusive evidence and will in most instances prove to be the diagnostic film. In this projection one sees characteristically one or more pools of encapsulated air just beneath the shadow of the sternum. The density and the extent of the air shadow vary with the degree of emphysema (figs. 2, 3 and 5).

As air in the mediastinum gives rise to pressure phenomena, the lung fields may have the appearance of pulmonary congestion (fig. 1).

TREATMENT

The treatment should be conservative in most instances, oxygen and stimulants being administered as indicated. However, increasing dyspnea and cyanosis are an indication for therapeutic aspiration (case 1).

SUMMARY AND CONCLUSIONS

Spontaneous pneumomediastinum is characterized clinically by the sudden appearance of respiratory distress and varying degrees of cyanosis, with or without such signs as distention of the veins of the neck, bulging of the precordium, distant heart tones, obliteration of cardiac dullness, a crackling sound synchronous with the heart beat, subcutaneous emphysema or signs of pneumothorax.

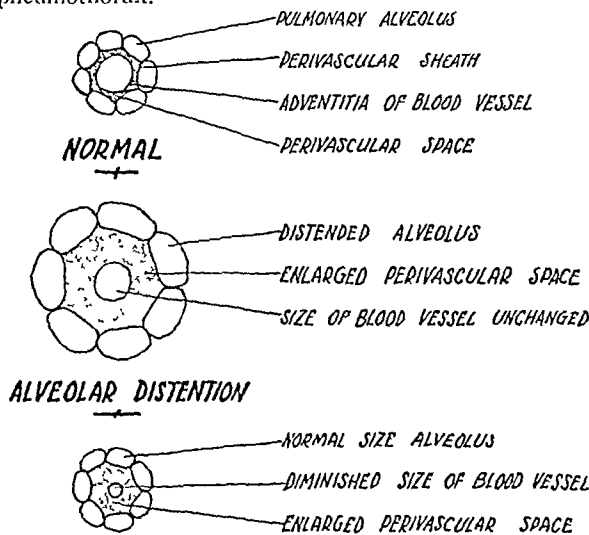


Fig 6.—Theory of alveolar rupture according to Macklin¹¹ The perivascular sheath is composed of the bases of pulmonary alveoli. Distention of the alveoli causes the perivascular sheath to be drawn away from the blood vessel, enlarging the perivascular space. Increasing pressure in the alveoli plus decreasing pressure in the perivascular space sets up a pressure gradient from the alveoli to the perivascular space and leads to rupture of alveolar bases. A similar pressure gradient results if there is a diminished blood flow to the lung, with consequent diminution in the size of the perivascular space. (This probably explains the high incidence of spontaneous pneumothorax among infants with congenital heart disease.)

The diagnosis is established with the aid of roentgenograms of the chest. The pathognomonic appearance of the lateral view is stressed.

Macklin's experimental work suggested that the cause of spontaneous pneumomediastinum is overdis-

tention of the lung and demonstrated the path of air from ruptured alveoli along the vascular sheaths to the mediastinum.

It appears likely from experimental and clinical observation that pneumomediastinum may secondarily cause pneumothorax, pneumoperitoneum or subcutaneous emphysema.

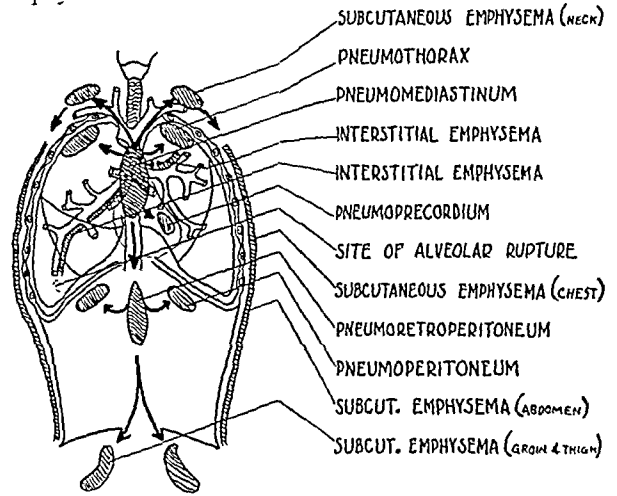


Fig 7.—The dotted area in the lower part of the right lung field represents an area of alveolar rupture. The shaded areas represent air in abnormal situations. Note that air from the mediastinum may enter the uninvolved portion of the lung and produce interstitial emphysema. The remainder of the diagram is self explanatory and shows the direction of the spread of air. Pneumothorax occurs if there is rupture of the mediastinal pleura, and pneumoperitoneum occurs if there is rupture of the peritoneum.

Treatment is usually conservative, but increasing dyspnea and cyanosis are an indication for therapeutic aspiration.

It is felt that pneumomediastinum in the newborn is a definite clinical entity and that its recognition and treatment, as described in the case reported, should result in a decrease in the neonatal mortality.

2501 Devon Avenue.

ABSTRACT OF DISCUSSION

DR. C. C. MACKLIN, London, Canada: In October 1940 I wrote, regarding pulmonic interstitial emphysema and pneumomediastinum, that "prompt appropriate therapy may save many lives, especially in children," and I feel that Dr. Gumbiner's experience supports this prediction. I am gratified at that accurate diagnosis made in these cases, and particularly for the brilliant demonstration by appropriate x-ray studies. Most of all I am grateful for this demonstration of a clinician who is on the lookout for cases of this sort; for without that attitude and scientific curiosity there can be no progress in this field. I feel assured that aberrant air in the interstitial tissue of the lungs and mediastinum, and contiguous parts, constitutes the basis of a definite clinical entity which has gone undiagnosed in most instances. I have spoken of this clinical entity as "air block," because the air presses on the pulmonary arteries and veins and on the heart and great vessels, so impeding the circulation and giving rise to cyanosis and dyspnea. Air block occurs much more frequently than is realized, and it probably occurs at all ages and under a variety of conditions. Intensive research will give it greater prominence as a serious clinical condition and as a cause of death. Often, I feel, it is associated with bronchopneumonia, and thus its manifestations may be masked. The authors have rendered a real service to the public and medical profession in making known the results of their careful studies. It is a field in which but little work has been done heretofore. That these newborn pneumonopathy cases may end fatally is shown by the experience of John H. Fisher, who has had two cases come to autopsy, one of which has been reported (*Canad. M. A. J.* 44:27 [Jan] 1941). In

this the pathologic findings are like those of the experimental animals which I have studied. I feel that atelectasis is an important predisposing cause, since it is associated with a compensatory emphysema. It is through the weakened bases of the alveoli which overlie the smaller branches of the pulmonary arteries and veins that the air breaks through into the connective tissue around these vessels, and, continuing to leak into these sheaths, it makes its way along them to the mediastinum. As the air accumulates it presses on the vascular system, so impeding the circulation and possibly giving rise to pain as well. In these infants it seems reasonable to assume that there was failure of expansion in certain areas of the lung, with compensatory alveolar ectasia, and that air broke through these stretched alveolar bases, probably during fits of crying.

PROCTOLOGY: ITS QUALIFICATIONS AND PROGRESS

CHAIRMAN'S ADDRESS

FRANK C. YEOMANS, M.D.
NEW YORK

Near the end of the last century a national association in gastroenterology and another in proctology were organized. Since then both groups have functioned continuously and successfully.

In 1916, mainly through the persistent efforts of leaders of these associations, the American Medical Association officially recognized both specialties by establishing the Section on Gastro-Enterology and Proctology. Today we meet in the twenty-fifth annual session. The eminent success of the section has fully justified its creation. Through the untiring efforts of a qualified personnel under zealous leaders these special fields of medicine have developed progressively and are now established on a sound scientific basis.

Briefly, the primary functions of any medical specialty are:

1. Scientific. The development of the specialty itself by scientific research and investigation and clinical observation.
2. Educational. (a) Teaching its elemental principles to undergraduate and graduate students, (b) the training of competent young doctors who contemplate taking up the specialty and (c) dissemination within the profession, by the written and spoken word, of useful knowledge which can be safely and effectively applied to practice.
3. Service. Supplying the highest type of medical service to the patient, which after all is the chief objective of medicine.

This program places a heavy but just responsibility on every association of specialists.

Our two special branches are concerned with the alimentary tract and its associated apparatus. Gastroenterology is essentially medical while proctology is chiefly surgical.

Speaking particularly for proctology, what qualifications should those possess who would enter this field, which may be defined as that of the bowel distal to the ileocecal valve.

To qualify properly in proctology one should enter the specialty through the door of general surgery. The essential personal qualifications for any honest specialist worthy of the name are the three I's: Intelligence, Industry, Integrity.

Intelligence and scientific attainment may be gaged in fair degree by personal interview and examinations.

for example those required for fellowship in the American College of Surgeons or for diplomate in surgery.

Integrity, however, is a moral quality which transcends all others. Without integrity the patient may be exploited and the specialty discredited.

It is generally recognized that many more adequately trained, ethical proctologists are needed in many sections of the country. The two agencies that can best solve the problem are the medical schools and the general hospital.

The curriculums of the undergraduate medical schools are sorely taxed. Yet, somewhere in this course each student should have the opportunity of seeing, under the guidance of a competent instructor, the common lesions of the distal portion of the bowel, of doing digital palpations and instrumental inspection of the rectum and pelvic colon and be taught that these procedures should, as a rule, precede roentgen studies.

The surgical staff of the general hospital should encourage a qualified proctologist to organize an outpatient clinic, follow up patients admitted to the wards, have access to the laboratories, and, when he has demonstrated his competence, be permitted to operate in both minor and major conditions within his field. If this reasonable plan were generally adopted, the interns would receive instruction sufficient to avoid the frequent glaring errors in diagnosis and treatment of proctologic conditions after they have finished their hospital residence.

Gastroenterology and proctology are the only clinical specialties represented among the sections of the American Medical Association which do not have independent boards for certification.

The Council on Medical Education and Hospitals has recently approved the action of the American Board of Surgery in regard to the recognition of proctologists. This provides that applicants must first meet the same requirements and pass the same examinations as applicants for certification in general surgery. In addition, applicants for proctologic surgery are required to pass a clinical test to be given by a committee representing this special field. We urge all those who contemplate specializing in proctology to become diplomates of the American Board of Surgery.

PROGRESS IN PROCTOLOGY

Medicine is not static but progressive. The scientific method of advance is usually slow, seldom dramatic, yet a brief survey of some of the advances in proctology during the past quarter century demonstrates that substantial progress has been made and that opinion has crystallized as to the best management of several important diseases.

Anatomy.—A restudy of the anatomy of the anorectum by Milligan and Morgan,¹ and others has clarified the complex musculature of this region and explained the channels through which infection spreads—two important and practical contributions to an understanding of the morbid anatomy of the parts and the surgical procedure indicated for their correction.

Proctosigmoidoscopy.—At long last the value of proctosigmoidoscopy is generally recognized. It is a routine in well equipped clinics but, alas, many hospitals still do not possess suitable equipment or have trained personnel, and all too frequently the procedure is omitted by the general practitioner. The modern

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941

1. Milligan, E. T. C.; Morgan, C. N.; Jones, L. E., and O'Connell, F. Surgical Anatomy of the Anal Canal and the Operative Treatment of Hemorrhoids, *Lancet* 2: 1119 (Nov. 13) 1937.

pneumoelectric tube is invaluable in diagnosis (including biopsy); for check-up observation and for treatment (a) with topical applications, (b) for implanting seeds of radon and (c) for surgical diathermy of tumors by fulguration, coagulation or the electric snare.

Roentgenologists as well as clinicians agree that proctosigmoidoscopy should precede a roentgen study of patients having symptoms referable to the distal portion of the bowel because the rectum and the pelvic colon, accessible to palpation and direct inspection, are the sites of about 75 per cent of all tumors of the large bowel. The roentgen ray frequently misses a small intestinal growth within the bony pelvic girdle while it is still small and amenable to early treatment. Moreover, these segments are involved in nearly all inflammatory and infectious conditions of the large bowel. In fact the disease process begins in the rectum in the majority of cases of amebic and bacillary dysentery and chronic ulcerative colitis.

Of course a roentgen study of the remaining colon or entire gastrointestinal tract is essential in many instances. Refinements of roentgenologic technic now frequently show the mucosal pattern and reveal many lesions which were formerly missed. Sigmoidoscopy and a roentgen study are not opposed to each other; on the contrary, they complement each other.

Anesthesia.—Aside from local infiltration anesthesia, caudal anesthesia, sacral-block anesthesia, spinal anesthesia and anesthesia with nitrous oxide-oxygen, ether, cyclopropane, avertin with amylene hydrate and pentothal sodium all have their indications in rectal surgery, and selection should be made appropriate to the individual patient.

Benacol,² the pioneer oil-soluble anesthetic, was originated in my clinic in 1927.³ It stimulated the production of several other similar combinations of chemicals in solution in oil. They are useful for the prolonged relief of pain in acute lesions, notably fissure. The relaxation of the sphincter muscles which follows the proper injection of an oil-soluble anesthetic enables the surgeon to dilate the muscles painlessly, exposing the lesion for topical applications, and thus effect a cure in the large majority of acute fissures of the anus.

Likewise, the injection of an oil-soluble anesthetic immediately after an operation for cryptitis, fissure or hemorrhoids gives in most instances postoperative comfort lasting from a few days to a week.

Pruritus Ani.—In my experience the injection of an oil-soluble anesthetic has afforded temporary or permanent relief in approximately 70 per cent of the many cases of so-called idiopathic pruritus ani in which it has been used.

Hemorrhoids.—Since it has been placed on an ethical and sound scientific basis, the injection treatment of internal hemorrhoids with sclerosing solutions has grown in popularity. The two agents used are a 5 per cent aqueous solution of quinine and urea and a 10 per cent aqueous solution of phenol or 5 per cent phenol in a vegetable oil.

The injection method yields excellent palliation in about 85 per cent of cases of uncomplicated internal hemorrhoids which comprise approximately 50 per cent of all cases. Relief is permanent in many cases, but recurrence in from one to five years in approximately 30 per cent requires another course of injections. How-

ever, one should remember if the patient has no general condition which bars surgery that hemorrhoidectomy is the procedure of choice for the permanent relief of all types of hemorrhoids.

Fistula.—Infection, usually of the anal crypts, is generally recognized as the basis of fissure, abscess and fistula. The latter is usually excised rather than incised, unless the internal opening is so high in the rectum that excision would impair control. In this event, operation in stages is indicated. If feasible, a tuberculous fistula should be excised *en masse* and wide of the disease, preferably with electrosurgery rather than with the scalpel. This technic seals the lymphatics and thus prevents the spread of a tuberculous infection.

Chronic Ulcerative Colitis.—This is still a puzzling problem. More knowledge of food, of nutrition, of the biologic processes and especially of the vitamins may shed light on the obscurity. Chemotherapy is achieving dramatic results in various types of infection. The sulfonamides have proved their worth in many cases of chronic ulcerative colitis. These experiences give promise that a more effective therapy than is now available will be developed for this serious disease entity.

The possibility of amebiasis should be ruled out in every case of nonspecific chronic ulcerative colitis by a careful sigmoidoscopy which reveals the pathognomonic lesions in early cases and frequently establishes the correct diagnosis, although the laboratory examination of the stools is negative.

Joseph Felsen, after extensive clinical observation and laboratory research, has emphasized the role of bacillary dysentery in the causation of chronic ulcerative colitis. To date, this theory has not received wide acceptance.

Stricture.—A wholly new concept of the etiology of inflammatory stricture of the rectum has arisen from the work of Durand, Nicholas and Favre in 1913⁴ and of Frei in 1925.⁵ Syphilis and gonorrhea have been relegated to a minor role. Lymphogranuloma venereum is generally conceded to be the etiologic factor in the vast majority of cases. In practically all cases of stricture with proctitis, the diagnosis of lymphogranuloma is established by obtaining a positive cutaneous reaction to an intradermal injection of an inactivated antigen. Frei used human antigen (1925). Grace and Suskind⁶ introduced mouse brain antigen (1934), and recently (1940) Rake, McKee and Shaffer⁷ have provided lygranum-antigen, produced by growing the virus in the yolk sac of the developing chick embryo. Mouse brain antigen and lygranum are comparatively free from the disadvantages of the human product, yet they appear to be at least equal to the Frei test in sensitivity and specificity.

Chemotherapy with the sulfonamides is proving to be a sovereign remedy for control of lymphogranuloma venereum and for prevention of stricture formation. Unfortunately, in most cases the disease has already progressed to the stage of stricture before coming under treatment. Nevertheless, the sulfonamides should be administered for their virostatic effect on the disease, although they exert little or no change in the stricture

2. Benacol contains benzocaine 3 per cent, procaine 2 per cent and benzyl alcohol 5 per cent in sweet almond oil.

3. Yeomans, F. C.; Gorsch, R. V., and Mathesheimer, J. L.: Tr. Am. Proctol. Soc., 1927.

4. Durand, M.; Nicholas, Joseph, and Favre, M.: Lymphogranuloma inguinale subaiguë d'origine génitale probable, peut-être Vénéérienne, Bull. et mém. Soc. méd. d. hôp. de Paris 35: 274, 1913.

5. Frei, Wilhelm: Eine neue Hautreaktion bei Lymphogranuloma inguinale, Klin. Wchnschr. 4: 2148 (Nov. 5) 1925.

6. Grace, A. W., and Suskind, F. H.: Successive Transmission of Virus of Lymphogranuloma Inguinale Through White Mice, Proc. Soc. Exper. Biol. & Med. 32: 71 (Oct.) 1934.

7. Rake, Geoffrey; McKee, Clara M., and Shaffer, M. F.: Agent of Lymphogranuloma Venereum in the Yolk-Sac of the Developing Chick Embryo, Proc. Soc. Exper. Biol. & Med. 43: 332 (Feb.) 1940.

itself. Usually the latter can be managed successfully with irrigations of potassium permanganate and biweekly dilation with Wales soft rubber bougies, in progression to number 7.

Resistant cases may require internal longitudinal incision of the stricture at three points (right, left and posterior) with diathermy, to be followed by routine dilation and irrigations. Multiple fistulas occurring with esthiomene or elephantiasis may require colostomy for relief. Rarely a stenosing tubular rectitis is best treated by perineal proctectomy. I did a perineal excision of the rectum on 2 patients having extensive strictures, intractable to other forms of treatment. One was a Negro woman aged 31, the other a white man aged 49. The result was excellent in both instances.

Carcinoma.—The majority of experienced surgeons and many pathologists now believe that the bulk of adenocarcinomas of the large bowel are mediated through adenomas and that their early detection and destruction is the surest measure for the prevention of cancer. Among the many adenomas of the lower part of the bowel which I have removed there were 18 specimens that showed precancerous changes or definite cancer. If the tumor is pedunculated, it is most simply and thoroughly removed with the high frequency electric snare; if sessile, it is destroyed by fulguration or coagulation.

Although definite palliation and a few five year cures have been reported of carcinoma of the rectum treated with irradiation, the results in general have been disappointing. One of the chief reasons for this failure is that the mucosa of the bowel is highly sensitive to the rays while the cancer is very resistant. Moreover, the unfavorable systemic effect of the roentgen rays, especially on the blood and blood-forming organs, tends to lower the vital resistance. As a consequence, the clinical consensus is that surgical excision is the best procedure in all operable cases, that is, if the patient's general condition is such that he can bear a major operation or he can be rehabilitated; second, that the lesion itself is so limited that there is reasonable expectation that it can be completely removed.

Extensive experience with the one stage abdomino-perineal excision of Miles, with permanent colostomy, yields by far the greater number of five year cures than any other for cancer of the rectosigmoid, lower pelvic colon and rectal ampulla. This rectosigmoid segment is the site of about two thirds of all cancers of the sigmoid and rectum. The operative mortality is within 15 per cent in the hands of surgeons competent in this field but is much higher for the average surgeon who sees comparatively few cases. The moral is that some one surgeon on a hospital staff who is especially interested should have the care of these patients so that he may perfect his technic.

Carcinoma situated in the sigmoid 1 or more inches above the pelvic pouch may be resected safely by inverting the distal end and permanent colostomy, more rarely by an exteriorization procedure and later closure of the colostomy to reestablish continuity.

For a rectal cancer, the upper limit of which can be reached by the finger, perineal excision gives excellent results and a very low operative mortality. It is especially indicated in the treatment of obese subjects, the debilitated and the aged.

This brief survey of progress during the last twenty-five years augurs well for the future of proctology.

555 Park Avenue.

THE TREATMENT OF MODERATELY SEVERE SCARLET FEVER

A STUDY OF ALTERNATE PATIENTS TREATED WITH SULFANILAMIDE, CONVALESCENT SERUM AND SCARLET FEVER ANTITOXIN

F. H. TOP, M.D.

AND

D. C. YOUNG, M.D.

DETROIT

The value of scarlet fever convalescent serum and scarlet fever antitoxin in the treatment of moderately severe scarlet fever was demonstrated by a control study reported in a previous paper.¹ Early in 1937 sulfanilamide was introduced in this country as a therapeutic agent for the treatment of hemolytic streptococcus infections, and a similar therapeutic study including sulfanilamide was repeated. During the period Aug. 1, 1937 through July 31, 1938 sulfanilamide, convalescent serum and antitoxin were given to alternate patients who on admission to the Herman Kiefer Hospital showed scarlet fever of a moderately severe grade. As in the previous study, the determination of the severity of the condition and the necessity for a therapeutic agent was the responsibility of two resident physicians who had been in the service for more than ten years. They had no part in the choice of therapeutic agent to be used. Whenever antitoxin was in order a serum sensitivity test was performed; if positive, either convalescent serum or sulfanilamide was used and the patient excluded from the series, and the next patient with scarlet fever of a moderately severe type was given antitoxin if the serum sensitivity test was negative. Both convalescent serum and antitoxin were administered in the hospital admitting room, while sulfanilamide was given by mouth as soon as the patient reached the pavilion, a period not exceeding one hour after admission to the hospital.

The sulfanilamide used was obtained in the form of tablets during the early part of the study and later was furnished in powdered form. The doses administered initially and subsequently at four hour intervals, called respectively the initial dose and the maintenance dose, were chosen rather arbitrarily, for there was little information regarding dosage when this study was begun. The dosage shown in table 1 is based on weight and shows both the initial dose and the maintenance dose. At present an initial dose larger than the maintenance dose is unnecessary for infections which are not severe, but during the time that the study was in progress a large initial dose was administered. The patient's weight was roughly estimated and the prescribed dose for that weight was given. The average total dose for all patients treated with sulfanilamide was 12.4 Gm., and the average duration of therapy was six and three-tenths days. The weight of the patient had no influence on the duration of therapy. Sulfanilamide determinations were not determined as a routine because the amount of drug given was too small to warrant its use. In the instances in which the reading was determined, none were found to be above 5 mg. per hundred cubic centimeters of blood.

This study was aided in part by WPA Project 82-4-120.
The sulfanilamide used in this study was furnished by Merck & Co. Inc.
From the Communicable Disease Service, Herman Kiefer Hospital; the Detroit Department of Health, and Wayne University College of Medicine.
1. Top, F. H., and Young, D. C.: Specific and Nonspecific Serum Treatment of Scarlet Fever, *Am. J. Pub. Health* 29: 443 (May) 1937.

The scarlet fever convalescent serum used was obtained from donors who had recovered from the disease within one year of their being bled in the serum clinic of the department of health. The various batches of serum were not tested for antitoxin content, but it is likely that the amount of scarlet fever antitoxin present in each cubic centimeter of serum was not greater than the amount (less than 2 units per cubic centimeter) determined by testing thirty-three batches of serum used in the previous study. Convalescent serum was given intramuscularly, and the dose was 30 cc.

Scarlet fever antitoxin was obtained from the laboratories of the state department of health, and one therapeutic dose of serum (6,000 units) was administered by the intramuscular route.

The therapeutic agents used in this study were given to alternate patients after they were admitted to the Communicable Disease Service. During the year 390 cases of moderately severe scarlet fever were divided equally among the three therapeutic agents used. The method by which the agents were assigned was considered paramount to obtaining comparable groups. The

TABLE 1.—Dosage of Sulfanilamide

Body Weight, Pounds	Initial Dose, Grains	Maintenance Dose, Grains
20-30....	10	2½
30-50....	15	5
50-70....	20	5
70-90....	25	5
90-110....	30	10
110-130....	35	10
130+....	40	10

TABLE 2.—Number and Proportion of Cases with Augmented Treatment by Type of Therapy

Therapy	Total Cases	Augmented Treatment	Per Cent Augmented Treatment
Sulfanilamide.....	130	11	8.5
Convalescent serum....	130	5	3.8
Antitoxin.....	130	10	7.7

following characteristics, which should be similar for all treatment groups, were tested for statistical comparability by using the chi square test: distribution of cases by month, by age, by temperature on admission to the hospital, by the day of disease on which treatment was begun and by the proportion of cases in which there were significant associated conditions. The three treatment groups did not differ with respect to the characteristics enumerated and for the purpose of this study may be looked on as similar in all respects except the kind of treatment received.

RESULTS OF TREATMENT

The therapeutic effect of the agents utilized was tested by observing the result with respect to (1) the number of patients who needed subsequent therapy similar to that used in the study, (2) the decline in temperature, (3) the number of patients with complications, (4) the occurrence of complications, (5) the proportion of patients with multiple complications, and (6) the proportion of patients dismissed from the hospital at the end of the minimum isolation period. Duration of the rash was not estimated because it is difficult to evaluate unless based solely on the presence or absence of rash.

AUGMENTED TREATMENT

For purposes of this study only one dose of scarlet fever convalescent serum (30 cc.) and one dose of scarlet fever antitoxin (one therapeutic dose) were administered by the intramuscular route, while the dose of sulfanilamide was governed by weight. It is com-

TABLE 3.—Temperature Pattern by Type of Therapy

Temperature Pattern	Sulfanilamide		Convalescent Serum		Antitoxin	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Normal.....	71	59.7	79	63.2	90	75.0
Lysis (5 days)....	28	23.5	21	16.8	12	10.0
Continued fever....	20	16.8	25	20.0	18	15.0
Total.....	119	100.0	125	100.0	120	100.0

TABLE 4.—Complicated Cases by Type of Therapy

Therapy	Total Cases	Number Complicated	Per Cent Complicated
Sulfanilamide.....	119	55	46.2
Convalescent serum....	125	63	51.2
Antitoxin.....	120	61	50.8

mon clinical experience to find that some patients with moderately severe scarlet fever need additional therapy. Occasionally, twenty-four hours after admission, the temperature has remained the same as on admission or has risen or the patient's general condition has shown no improvement. Whenever additional therapy was necessary, this was considered as augmented treatment, was so recorded and the case excluded from the study. The number and proportion of patients needing augmented treatment is shown in table 2. It will be observed that but few patients in each treatment group were given additional therapeutic aid. In the convalescent serum group it was necessary for only 5 patients, and the number was 10 and 11 for the antitoxin and

TABLE 5.—Occurrence of Complications by Type of Therapy

Complication	Sulfanilamide		Convalescent Serum		Antitoxin	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
Rhinitis.....	31	26.1	41	32.8	47	39.2
Cervical adenitis, nonsuppurative..	16	13.4	15	12.0	15	12.5
Otitis media, catarrhal.....	9	7.6	7	5.6	..	..
Otitis media, suppurative.....	8	6.7	9	7.2	7	5.8
Mastoiditis.....	2	1.7	2	1.6	1	0.8
Bronchitis.....	7	5.9	4	3.2	6	5.0
Arthritis.....	4	3.4	3	2.4	..	..
Paronychia.....	3	2.5	3	2.4	8	6.7
Abscess, soft parts.....	..	..	4	3.2	5	4.2
Nephritis.....	1	0.8	2	1.6	2	1.7
Bacteremia.....	..	..	1	0.8	..	..
Carditis.....	..	..	1	0.8	..	..
Ethmoiditis.....	..	..	..	..	1	0.8
Bronchopneumonia.....	..	..	..	..	1	0.8
Total cases treated.....	119		125		120	

sulfanilamide groups respectively. Convalescent serum appears to advantage, but the differences noted and not significant for a study of this size ($p = 0.29$).² Patients needing augmented treatment were excluded from further consideration in this study, causing slight changes in the totals of the treatment groups.

2. When p is 0.03 or below, differences found are generally considered significant; that is, they are not considered to be due to chance variations.

TEMPERATURE PATTERN

The therapeutic response, as evidenced by an effect on temperature, is shown in table 3. The patients were divided into three groups with reference to temperature: the first, a group in which fever declined to normal or within one degree of normal within twenty-four hours; the second, a group in which fever declined by lysis within a period of five days, a result ordinarily noted in patients with moderate scarlet fever not treated with serum; third, a group in which fever was maintained or in which a temporary drop occurred, followed by a rise within twenty-four hours.

A temperature decline to normal occurred in 75 per cent of patients given antitoxin, in 63.2 per cent given convalescent serum and in 59.7 per cent given sulfanilamide. Among the remaining patients in each treatment group a decline by lysis occurred most frequently among the sulfanilamide-treated group, followed in order by the convalescent serum and the antitoxin-treated group, the respective proportions of each treatment group being 23.5, 16.8 and 10 per cent. Continued fever occurred less commonly among patients treated with antitoxin and sulfanilamide, while convalescent serum showed the poorest results in this respect. The

the proportion in the antitoxin group is highest (39.2), while the convalescent serum group is midway between (32.8): The differences are not significant ($p = 0.09$). No real differences are noted for nonsuppurative cervical adenitis. The number of times that catarrhal or suppurative otitis media developed was small for the entire experience. Catarrhal otitis media occurred with the same frequency in the sulfanilamide and convalescent serum groups but did not occur in the antitoxin group. With respect to suppurative otitis media, the proportion is about the same for all treatment groups. When catarrhal and suppurative otitis media are combined, it is apparent that there is a difference in favor of the antitoxin group, but this is not statistically significant ($p = 0.08$).

The remainder of the complications listed in the table occur too infrequently to warrant comment. Consideration of the entire table must lead to the conclusion that variations in the treatment groups are not striking (table 5).

MULTIPLE COMPLICATIONS

The number of complications per person is shown in table 6. As might be expected with the mild form of scarlet fever now encountered, few persons had more

TABLE 6.—Number of Complications per Person by Type of Treatment

Treatment	Number of Complications per Person				Complications Group			Entire Group	
	1	2	3	4	Number of Persons	Number of Complications	Complications per Person	Number of Persons	Complications per Person
Sulfanilamide									
Number....	35	14	6	..	55	81	1.5	119	0.7
Per cent....	63.6	25.5	10.9						
Convalescent serum									
Number.....	42	14	6	1	63	92	1.5	125	0.7
Per cent....	66.7	22.2	9.5	1.6					
Antitoxin									
Number....	36	19	5	1	61	93	1.5	120	0.8
Per cent....	59.0	31.1	8.2	1.6					

differences noted appear to be significant and statistically are borderline ($p = 0.04$). A larger series of cases might demonstrate real differences. However, variation between antitoxin and convalescent serum is not appreciable and bears out past experience.

COMPLICATED CASES

Complications occur in moderately severe scarlet fever more frequently than one would surmise, and this is particularly true of hospitalized cases. This would not be so evident if only major complications, such as otitis media, mastoiditis, cervical adenitis and other less frequent but equally severe complications were solely included. In this analysis all complications incident to scarlet fever infection are considered, even such mild conditions as serous rhinitis and paronychia. Table 4 shows the number of complications in each of the treatment groups, and it is readily apparent that the proportion of complicated cases in the three groups is similar. The advantage shown by sulfanilamide is very slight and not significant.

OCCURRENCE OF COMPLICATIONS

The commonest complications of scarlet fever encountered in hospital practice are, in order of their frequency, rhinitis, cervical adenitis and otitis media. This is borne out in this study by the data in table 5. Rhinitis does not occur with equal frequency in the three treatment groups. The proportion of patients with rhinitis is lowest in the sulfanilamide treated group (26.1).

than two complications each. The proportion of complications in each group is about the same, and differences are due to chance variation ($p = 0.84$).

The table also shows the number of complications per person with complication, which is the same for each treatment group. The number of complications is less than 1 per treated patient and is similar for each treatment group (table 6).

DISMISSAL STATUS

As previously noted,¹ the dismissal status is not a particularly good criterion for evaluation of treatment.

TABLE 7.—Dismissal Status of Cases Admitted to the Hospital

Age	Total in Group			Late Dismissals			Proportion of Late Dismissals		
	S	C	A*	S	C	A	S	C	A
Under 1 year	27	30	37	12	12	21	44.4	40.0	56.8
1-4 years	57	47	52	19	18	8	33.3	38.3	15.4
5-9 years	21	22	18	5	2	5	23.8	9.1	27.8
10-14 years	6	11	4	—	3	—	—	27.3	(11.1)
15-19 years	8	15	9	—	1	1	—	6.7	—
Totals	119	125	120	36	37	35	30.3	29.6	29.2

* S = sulfanilamide, C = convalescent serum and A = antitoxin.
† () = a percentage based on less than 10 cases.

especially if only one dose of serum is administered. Both antitoxin and convalescent serum cannot reasonably be expected to exert much influence on the incidence of complications which occur two weeks after the administration of serum. The same is true in the

instance of sulfanilamide, the administration of which was maintained only during the first week in the hospital. An influence might be exerted on the incidence of complications during the first two weeks of illness, but a large proportion of complications occur during and after the third week of convalescence. However, the soil may be prepared, so to speak, during the first two weeks for what the patient may be exposed to in the hospital during the remainder of his stay. For this reason, data on the dismissal status are included. In the previous study, no difference was noted in the proportion of patients dismissed at the end of the required minimum period of isolation, and in this clinical experiment the proportion of late dismissals in each of the treatment groups (total cases) is practically the same. There are striking differences observed when age is considered, but too much weight cannot be given to the results because of small numbers.

COMMENT

Although the clinical study was completed in the late summer of 1938 and the analysis early in 1939, there was some reluctance on our part to publish the results. Timidity was due not to lack of confidence in the validity of the data or in the manner of collection but rather to the fact that in our hands sulfanilamide appeared to be only slightly less valuable in the dosage given than one therapeutic dose of antitoxin (6,000 units) or 30 cc. of convalescent serum administered intramuscularly. By this time it was already evident experimentally that sulfanilamide did not affect the clinical manifestations or complications directly caused by toxin elaborated by hemolytic streptococci.

In recent years scarlet fever has become a progressively milder disease. Both septic and toxic attacks still occur, but the number is proportionately smaller. The therapeutic agents used in this study would be inadequate in amount for septic and toxic attacks. Moderately severe scarlet fever also occurs less commonly, as shown by the fact that this type represented 37.8 per cent of 10,666 cases of scarlet fever dismissed from the Herman Kiefer Hospital during the five year period 1927-1931, while during the five year period 1932-1936 the proportion of this type among 10,777 dismissals was 21.7 per cent, a considerable decline. Both the organism and its toxin contribute to the clinical syndrome called scarlet fever, but the quantitative effect of each in any given case would appear at best controversial. Antitoxin is valuable in the treatment of moderately severe scarlet fever and is particularly indicated for toxic manifestations. It has been amply demonstrated that scarlet fever convalescent serum is of value in the treatment of moderately severe scarlet fever. Soon after sulfanilamide was used in the treatment of streptococcal infections it was found that it had little effect on toxic manifestations of streptococcus origin. This finding was borne out in early reports. Any value that sulfanilamide might have in the treatment of scarlet fever would likely be due to antibacterial properties, and it is now generally conceded that the effect is bacteriostatic rather than bactericidal.

During the past three years, there have been numerous reports dealing with the use of sulfanilamide in the treatment of scarlet fever. These clinical reports fall into two groups; first, those which include scarlet fever among other streptococcal infections treated and, secondly, those which deal solely with scarlet fever. The

first group does not lend itself to evaluation, while the second group includes few studies which are adequately controlled. The use of sulfanilamide in the treatment of scarlet fever has been reviewed sufficiently often to allow its omission in this paper. We are interested in the fact that there is a difference of opinion concerning the value of sulfanilamide in moderate or moderately severe scarlet fever.

Of all articles published thus far, that of French³ appears on inspection to be the best planned and the most exact in the method of assignment of cases to treatment groups. She finds that the use of sulfanilamide is not justified in the treatment of scarlet fever. The dose used was large and therapy was maintained for the entire period of isolation. However, when indicated, she gave scarlet fever antitoxin on admission to any patient who was thought to require it, irrespective of whether the patient was to receive sulfanilamide or not. Although the number receiving antitoxin in each group was the same, we feel that any therapeutic agent to be tested should be given alone and not in conjunction with another agent, particularly one of such proved value as scarlet fever antitoxin. For this reason we excluded patients with augmented treatment from further consideration in the series. French probably labored under the same difficulty that we did, namely the undesirability (in the eyes of the medical and nursing personnel) of withholding a known valuable therapeutic agent from one half of the cases (controls). We partially circumvented this problem in the previous study by introducing as an unknown serum diphtheria antitoxin one dose of which contained 1,000 units, alternating this with scarlet fever convalescent serum and antitoxin.

In the present study sulfanilamide replaced the diphtheria antitoxin and we feel that, with each patient in the study receiving but one therapeutic agent instead of two, the exact effect of any one can better be determined. For this reason the present study is submitted. Additional studies are needed to confirm or refute the findings because clinical evaluation cannot feasibly be based on deaths but must rely on differences in behavior in cases in which recovery occurred and this entails a few large studies or many well conducted small ones. When results of therapy are so nearly alike, as noted in this study, it is impossible to state that any of the therapeutic agents used are of value, unless the impression is based on other clinical or experimental studies. In the previous study 30 cc. of convalescent serum and one therapeutic dose of antitoxin (6,000 units) given intramuscularly were found to be of equal value in the treatment of moderately severe scarlet fever. The same statement applies in this study.

SUMMARY AND CONCLUSIONS

1. During the one year period Aug. 1, 1937 through July 31, 1938 a series of 390 patients with moderately severe scarlet fever were treated under control conditions with (a) sulfanilamide, (b) scarlet fever convalescent serum and (c) scarlet fever antitoxin.

2. Status-on-admission factors known to influence the course of the disease, such as (a) the month of attack, (b) age, (c) temperature on admission, (d) day of disease on which treatment was begun and (e) proportion of cases presenting significant associated conditions, were similar and not significantly different for the three treatment groups.

3. French, Jane O.: The Sulfanilamide Treatment of Scarlet Fever. *J. Hyg.* 39: 581 (Sept.) 1939.

3. The results of this study indicate that there is no great difference in the therapeutic effect in cases of moderately severe scarlet fever when sulfanilamide, convalescent serum and antitoxin are administered in the dosage used. Antitoxin and convalescent serum give better results than sulfanilamide, but the differences are not statistically significant.

4. In a previous study, 30 cc. of scarlet fever convalescent serum and one therapeutic dose of scarlet fever antitoxin (6,000 units) gave equally good results when administered by the intramuscular route. Their similarity in value in the dosage cited is again demonstrated.

5. No attempt is made to explain the results obtained. The study is presented as an addition to the literature on the subject.

Taylor and Hamilton Avenues.

HEALTH EDUCATION

AN APPRAISAL

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Perhaps the time has come, as is apt to be the case periodically in most fields, for a fresh orientation as to what in general we mean by health education. There are still those in public health who see little or no value or scope in health education. There are also those, in increasing numbers, who appear to think that health education and public health are practically synonymous terms—coextensive in range and content. Between these two extreme views, what is health education's real status?

Parenthetically, let me make it clear at the start that I am attempting to appraise the relative importance of health education in the public health field as compared with other elements. I am not attempting an analysis from a psychologic or other angle, of what constitutes effective health education or what technics will or will not arouse real interest and action. This is another story, though indeed a very important one.

We might, in a few words, remind ourselves of the origin in time and in its interrelationships of the health educational aspect of our public health program. Recently Dr. W. W. Bauer has said that "All public health workers are health educators whether they know it or not." This is more nearly true today than at any time in the past, and it is at least a laudable aspiration. Still, there are even now some essential workers in the public health field who have little or nothing to do with health education, such as the laboratory man typing sputums in pneumococcic infections or examining blood specimens in sulfonamide therapy. What these men are doing is basic in the public health program but really cannot be called health education. The same would apply to the engineer operating a water purification or sewage treatment plant, and in the main to the research work that developed the antigen for the pneumococcus vaccine or that originally purified the antibody in serum therapy. These men may do extremely important work and still not undertake even professional teaching activities, let alone popular health education.

As a matter of fact, health education played little or no part in the beginning eras of modern public

health. It came into play, for obvious reasons, as public health evolved into the period of preventive medicine, where the attainment of disease preventive objectives (particularly in a democracy) is dependent on individual motivation. But back in the sanitary era the typhoid epidemics and other sanitary catastrophes of that earlier time were in fact the "educators" of the citizens and of the voters, inducing them, among other things, to appropriate adequate funds for the collective provision of sanitary measures, such as those that insure a safe water supply. But the community collectively did the job for the individual.

On the other hand, beyond the safe use of water to restrict the transmission of disease, the community cannot, by law, compel the individual to the proper constructive use of water for the attainment of certain hygienic and physiologic advantages. It cannot make him take enough water daily to meet the chemical needs of the body (though the importance of this has been somewhat overemphasized by health education); it cannot compel him to bathe with sufficient frequency, although here too health education has exaggerated the importance of the measure; it cannot even compel him to wash his hands with hot water and soap before he eats and after toilet. These uses of water must depend on personal information, on individual motivation—in fact, on health education (or, perhaps, on custom built on the commercial advertising of sanitary equipment, soap, and so on), though it must indeed be recognized that individual initiative won't be effective unless the water and the necessary utensils also are available.

In any event, we are now in the age of personal hygiene and preventive medicine, where health education comes fully into its own. Yet this modern phase of public health grew out of and is based on sanitation and is, in fact, the superstructure of public health. Health education is an essential part in that superstructure. How is it built into that framework? How much of a part does it play in the functioning of this whole public health mechanism? Let us ask ourselves these and a few other concrete questions.

WHAT CAN REASONABLY BE CLAIMED FOR HEALTH EDUCATION?

Well, there are some perfectly reasonable claims as to its accomplishments, though these claims are often confused, and the evidence is almost always fairly intangible. Yet we are all convinced that health education not only has important direct products to its credit but some by-products of outstanding importance.

By way of illustration, let us look for a moment at the diphtheria prevention program. Certainly health education of the lay public has contributed materially to the mortality improvement for this disease. Throughout the whole of 1940 Toronto, Ont., and Newark, N. J., two large cities, went without a single case of this disease. New York State, including the city and upstate area, with over 13,000,000 population, had several consecutive winter months in 1941 without a death from diphtheria. The million and more weekly industrial policyholders of the Metropolitan Life Insurance Company in the Pacific Coast and Mountain states went through the first eight months of this year without a diphtheria death. Certainly all of the literature, films, exhibits and lectures have played a big part in these accomplishments. Personal initiative by physicians, parents, teachers and others has been influential. Yet many

other elements have entered into the picture, such as the daily work of the private medical practitioner, the doctor's increasing use of prophylactic measures in his practice, the establishment of clinics, the production of biologic products and their distribution by communities, the postgraduate instruction of physicians with reference to antitoxin therapy as well as immunization and the like. While in fact the whole "struggle" has been in general educative, yet it is difficult in a situation of this kind to say just how much lay health education specifically has done. It can however be incidentally pointed out that, while it has been endeavoring to educate the public, it has also had a material effect on the medical mind as well. Many physicians first heard of the Schick test through lay contacts or through the perusal of literature primarily intended for lay consumption. This might be noted as a by-product of lay education.

One might take another example—the Framingham Tuberculosis Demonstration, where the tuberculosis death rate has declined from 121 per hundred thousand prior to the demonstration to 12.5 in 1940. Never before in the history of public health was a population so intimately and thoroughly exposed to health education as were the people of Framingham from 1916 onward. All conceivable educational channels were used and all important points in tuberculosis control stressed. The private medical practitioner participated wholeheartedly, and the public responded with a high degree of cooperation and understanding. Health education was an important factor in this program. Yet many other factors also were involved, even though health education may have had, directly or indirectly, something to do in securing and enhancing the effectiveness of each of them. I have in mind not only adequate appropriations but such essentials as the employment of full time medical staffs in schools and industries, the provision of adequate bed capacity for active cases, the proper direction of first class medical staffs in good sanatoriums, the establishment of local x-ray diagnostic equipment and milk pasteurization. There were obviously many basic items of sanitation and community equipment playing a part—brought about to some extent through health education and made more effective by health education but distinctly not in themselves health education.

IS IT EVER POSSIBLE ACCURATELY TO MEASURE HEALTH EDUCATION?

The agency with which I am associated, namely the Metropolitan Life Insurance Company, has carried on for years an extensive health educational program among its industrial policyholders. In this program it has used nearly all available devices, has had a fairly adequate budget and has enjoyed the cooperation of an exceptional instrument of education, namely the company's agency force in its contacts regularly with millions of homes. This work has now been going on for about thirty-two years. The results are to some extent measurable and are also quite favorable. It would seem that this health education program has borne fruit.

If the life expectancy at birth of these industrial policyholders is compared with that of the general population, it appears that since 1911 the policyholder group has gained about seventeen years in life expectation, as compared with about ten years for the country's population in general. It has also been calculated that the figure for lives saved in 1939 alone is approximately

112,000 in excess of the lives that would have been saved if the industrial policyholders had experienced only the mortality improvement since 1911 that has characterized the general population of the country. When this experience is broken down by causes of death, and when attention is paid particularly to those diseases at which health education has been especially aimed, we find, for instance, that since 1911 there has been a 92 per cent improvement in diphtheria mortality in the general population of the United States and a 95 per cent improvement in this industrial policyholder group—an excess policyholder improvement of 3 per cent. Without giving all the details, I may say that similar comparisons show an excess improvement in pneumonia of 7 per cent, in tuberculosis of 10 per cent, in diseases of the puerperal state of 17 per cent, and in total accidents of 24 per cent.

Of course, this insured group has shared with the general population all of the other influences that have been prevalent in the country in addition to the company's own health educational program. However, there is a complicating factor, and that is the special nursing service provided by the company for acutely ill policyholders and aimed particularly at problems of the industrial insurance group. In this nursing service special attention has been paid to diseases of the puerperal state and communicable diseases, including diphtheria and pneumonia. How much this nursing service, instrumental as it has been in also encouraging adequate medical care, may have influenced this mortality experience, it is difficult to say. Equally difficult is it, therefore, to appraise separately the health educational values.

There is one element in the Metropolitan experience that may be a more direct and more sensitive measure of health education than any of the disease factors cited, and that is the experience with appendicitis. Beginning in 1934 the company initiated an educational program aimed at the prevention of unnecessary fatalities from this disease. This has been carried out by means of literature, advertisements, posters, lectures and news releases. The cooperation of the medical profession, and particularly of the company's agents and medical examiners, has been forthcoming. During this period the company has experienced among its industrial policyholders an improvement in appendicitis mortality of over 30 per cent, and a drop of 40 per cent since 1929. The rate has been declining rapidly and is still declining. (Incidentally, the general population improvement in this period since 1934 has been about 24 per cent.) Other reports, from hospital studies in Philadelphia, for instance, show a decline in perforated appendicitis from 43 per cent in 1928-1929 to 19 per cent in 1937. Moreover, into this picture have come no great new medical discoveries, such as toxoid in diphtheria, serum and chemotherapy in pneumonia, or immunization procedures as in other communicable diseases, although there may have been some modest advances in surgical skill, some stimulus to hospitalization through insurance plans, and, very recently, some experimental use with sulfonamide derivatives and other products in the treatment of peritonitis following perforation. No important changes have taken place in diagnostic or therapeutic practices. One might say that practically the only outstanding new factor in the picture, in relation to the other constants or changing minor variables, has been this intensive educational program. Perhaps, therefore, this might be offered as a fairly good example of a health educational accom-

plishment. Practically all other examples that one can think of share the limitations pointed out not long ago by Dr. Martha C. Hardy, who stated that "Evaluation technics in health education . . . are very limited. . . . These results, and reports from other investigations, while interesting, seldom permit conclusive answers. They are much more likely to raise questions than they are to produce evidence of the effects of health education."

ARE HEALTH EDUCATORS SOMETIMES CONFUSED AS TO DEFINITION?

I need perhaps quote only one or two examples to indicate positive answers to this question. One who has contributed a great deal indeed to physical education recently said that "Health education in schools has three major lines of effort: health service, healthful living in the school, and health instruction." I expect most readers will agree that this does not seem to be a very accurate or clear concept. This leader then goes on to explain what he means by each of these divisions of effort. He says, for instance, that under "health service" he means "examination and protection of children." Under this heading he includes also the search for defects and structural disease and the examination of "attitudes, personality traits and responses, as well as defects and organic health disturbances." In other words, he lumps under one of these phases of "health education" all of the professional, technical, medical and clinical procedures in the schools. Obviously these procedures are not health education, though of course they should be health educational.

IS THE SIGNIFICANCE OF HEALTH EDUCATION SOMETIMES EXAGGERATED AND ITS SCOPE MAGNIFIED OUT OF PROPORTION TO REALITY?

The attitude reflected in the foregoing quotations would seem to be one example of a clearly affirmative answer to this question. Others will probably occur to most of us. If I may carelessly employ metaphors, many have been impressed with the tendency on the part of health educators to "put the cart before the horse" or at any rate to confuse the part for the whole. This may be in part due to two factors:

1. Professionally trained people have often approached health education through highly specialized channels, such as those of physical education. They consequently seem to acquire an out of focus view or a tangential rather than an inherent relationship to the public health fields.

2. For nonprofessionally trained workers, health education has been the back door into the barn of preventive medicine, as easy access for those with no specific technical training for any of the basic jobs in public health and preventive medicine. In spite of this, or perhaps because of it, those entering by this door seem disposed to think that the barn and the door are one and the same thing.

An illustration of this confusion and of this identification of the part with the whole seemed to be implied in a recent request from a health educator that a paper be prepared on the subject "Do the Recent Draft Figures Show Serious Gaps in Health Education?" This arresting suggestion involved, apparently, two misconceptions: (1) that health education can ordinarily be measured by its effects and (2) that health education was the important if not the only factor (or should

have been) in determining the results of the current draft figures, as compared with those of twenty-five years ago.

Of course, the draft figures will be turned in all directions. Those who want to use them for the further extension of socialized services are already loudly lamenting the allegedly poor state of the nation's health (which really was never better) and will no doubt find ammunition that can be diverted to this end. Those who wish to "view with alarm" will point out that more are being rejected today than in 1917, but this comparison is unwarranted, because today we started with the idea of careful selection for training, using higher standards and more delicate methods. More are being rejected for certain causes, such as ear and dental defects. From this it may be claimed that our whole health effort and our machinery for medical care have been ineffective and that health education has completely failed, yet we know this to be a gross misinterpretation. On the other hand, those disposed to take a favorable view will find plenty of supporting evidence. In fact, the tuberculosis figures have already been pointed to as evidence of the value of health education in this intervening period, in view of the rejection in 1917 of higher percentages for pulmonary ailments than in 1941. Very probably health education has played a part in this situation, but how important also have been a great variety of other factors, such as isolation and hospitalization, improvements in x-ray technic and fluoroscopy, pneumothorax therapy, milk pasteurization, advances in nutrition, and higher economic living standards?

Confusion of definition, magnification of importance and misunderstanding as to measurability sometimes seem to lead to an attitude that assumes not only that all health activities are a part of health education but also to the belief that only health educational activities should be tolerated in schools and elsewhere. For instance, one finds in an editorial in a recent number of the *Journal of School Health* a statement that "All health services practiced in schools can and should be educational." No one would quarrel with that. The editorial goes on, however, to imply its acceptances of the corollary that "if the service cannot be made educational it should not be in the schools at all." This is to ignore certain basic essentials in school health programs. We should not forget that the medical examinations of children in schools is done in part to apply technical skills with the object of discovering early disease, of finding defects that can be corrected, of controlling the spread of communicable diseases and of disclosing personal practices that have a bearing on the physical and mental status of the child. The basic service here is a clinical, epidemiologic and physiologic one. It has some value, whether educational or not. Of course, these procedures should always be used for constructive health educational purposes, but that is not their sole or primary purpose though it may become their greatest measure of utility in highly sanitized communities.

HAS HEALTH EDUCATION SOMETIMES BEEN MISLEADING AND OBSTRUCTIVE?

It seems likely that there are examples warranting an affirmative answer to this question. Many will remember the great emphasis of two decades ago on toothbrushing as a means for the prevention of dental decay. Not only was the child taught in school cer-

tain highly detailed technics as regards toothbrushing, but whole schools and squads of children were mobilized in playgrounds and elsewhere and exposed to toothbrush drills, thus overemphasizing this already exaggerated point. The same amount of energy, time and funds diffused nationally through this program, if concentrated into a limited field of research, let us say into the relationship of nutrition or of heredity to dental caries, might have produced constructive results, and at any rate probably would not have been largely wasted.

HAS HEALTH EDUCATION SOMETIMES FAILED?

If health education has failures in its record, it is probably because of misapplication, such as in the aforementioned toothbrush drill era, or it is because, through its own megalomania, it "bites off more than it can chew." An example in the latter category may well be the experience in the matter of disease control in the province of Quebec. In this province death rates from controllable disease, such as pneumonia, tuberculosis and diphtheria, still remain much higher than in the other Canadian provinces or in the United States. These diseases refuse to respond to educational attack. Such control efforts under identical epidemic conditions are much less successful than elsewhere.

By way of illustration, let us take the recent influenzal pneumonia outbreak, which early in 1941 spread across both Canada and the United States, from west to east. In most parts of the two countries, in spite of the increase in influenza with accompanying increase in the incidence of pneumonia, the pneumonia death rate for this period in 1941, as compared with 1940, did not increase but actually decreased, evidently reflecting the effectiveness of serum therapy and chemotherapy. In contrast, in Quebec province there was not only an increase in influenza and pneumonia incidence, but a sharp increase in pneumonia fatalities—quite obviously for the reason that medical practice and public health procedures in this province are backward and that the province does not yet have, in comparison with other areas, these therapeutic advantages in meeting the pneumonia problem.

Now, what will bring pneumonia under control in Quebec province? Health education? What will make modern diagnostic and therapeutic procedures available? Health education? It may help a little in all directions but it will not solve the problem. As a matter of fact, a great deal of health education is being done and has been done in this province. The Metropolitan Life Insurance Company has concentrated on these questions there even to the extent of preparing health education material in the native language. It insures a larger percentage of the population there than elsewhere. It has a higher industrial policyholder mortality rate there than elsewhere. It and other agencies have tried health education, but that does not meet the need.

What is needed is a whole set of basic facilities and services, such as better equipped and staffed medical schools, improved medical curriculums, better undergraduate and postgraduate medical education; better basic training for nurses, more competent public health training for nurses; nonpolitical public health administration; more adequate appropriations, more adequate supplies of biologic products for use free or at cost; a greater awareness on the part of physicians of the preventive medical point of view; more adequate hospital

facilities; better and more numerous physical plants for clinical services, and so on. While health education has a bearing on all of these things and will help to make them available and to get them used when available, it will not in itself produce them or solve the problem without them. Under present conditions in this province its efforts are largely wasted and doomed to partial failure.

HOW SERIOUSLY SHOULD HEALTH EDUCATORS TAKE THEMSELVES?

From the foregoing the implication would seem to be that we should not take ourselves too seriously. We should remember that health education is one of a number of things. Health educators are probably feeling an unwarranted anxiety in these trying times. They are for instance, watching the draft figures anxiously. They have "staked everything" on producing results through education, and the present generation, coming up for examination, is really their first child to reach maturity. Nobody knows, because we have never had any adequate method of measurement, just how well he has learned his lessons. Health educators, according to their disposition, are now anticipating feeling very good or very bad when the figures begin, in final form, to come through. Yet they should remember that they are dealing with one factor only, with one of the most intangible of elements and the hardest one to measure. Should conditions prove to be better or worse, there would be nothing to crow or to weep about from the angle of health education or from any other single angle in the picture, as too many elements share this responsibility.

WHAT THEN IS THE CHARACTER OF HEALTH EDUCATION AND ITS RELATION TO PUBLIC HEALTH?

While the element health education is not all important, it is important to all other elements in public health and preventive medicine as practiced in the modern community. Health education helps to create its associate units essential in a basic health program. It should permeate all of these related services and influences. As a matter of fact, without these concrete services, such as medical examinations in schools, clinic facilities in health centers and examination services in industry, health education remains a highly intangible, theoretical, abstract and largely futile commodity. It finds its substantiation, its realization in its relationship to these practical services. It is visualized, precipitated, brought out of the realm of theory by its contact with its basic service colleagues. It therefore has a creatively reciprocal relationship with the other elements in public health. It enhances their value and reality and finds its own realization through them. It is the one element that contributes most to making the whole substantially greater than the sum of its parts.

HAS HEALTH EDUCATION A UNIQUE SIGNIFICANCE?

While health education is one of many elements in the public health picture, it is different in character from any of these elements. It is not just "one other thing" in preventive medicine. It is or should be an ingredient in all the basic services in preventive medicine. All other services should be shot through with it or illuminated by it. It is actually or potentially inherent in all of them. It might perhaps be called the

enzyme in the process. In the digestive process are involved the mucous membrane of the gastrointestinal tract, the cells of the villi of the intestinal walls, the blood vessels, the cells of the blood stream, the musculature and the constituents of the food itself. These all have to be there and all have to do their part. They constitute the basic essentials. But their efficiency and thoroughness are stimulated and released by the effect of the digestive enzyme on them. Now in public health, within the school walls for instance, health education bears a similar relationship to the doctor, the nurse, the clinic, the laboratory and the other personnel and equipment. Perhaps the analogy has flaws—doctors are apt to do some good in just examining and treating children, with little or no health educational motive, while digestion won't take place at all without the enzyme. Nevertheless in schools, in health centers and clinics, in industry and in all phases of the public health program it is the enzyme "health education" that implements and activates its associate forces in the cooperative effort to prevent disease, promote health and build the vigor and endurance demanded by the stress of living in our time.

All that I have said applies to health education in a democracy—in a free society, where initiative, judgment and individual decision and enterprise still function—where it is still possible and indeed necessary to try to inform and persuade people as to what they should do for the benefit of themselves and the community. On the other hand, health education and indeed all education as we know it are of disappearing importance in most of the rest of the world, where the "educator," turned propagandist, tells the people what to do, although even in Germany the chief propagandist is said recently to have lamented the fact that there were still a few people in his country who could not be told how to act and live and think.

Health education, and indeed all education as we think of it in America, is not only an essential ingredient in the free democratic process. Today, more than ever before, it must play a vital part in sustaining and justifying our way of living. As Hutchins has said, "What the world needs, what this country must have, is free minds . . . minds informed by principles derived through human experience through the ages; minds that are open no matter what waves of change beat upon them." Such education, in all fields, including our own, is in the long run our chief defense against the growing trends toward socialization, collectivism, dictatorship and totalitarianism, both abroad and at home.

1 Madison Avenue.

The President's Birthday Ball.—The support of research through public subscription such as the President's birthday ball or the Christmas seal campaign of the National Tuberculosis Association presents special features worth comment. It would be a splendid tradition if each president could designate on what disease the proceeds of the homage tendered him should be spent. Then with an occasional change of presidents we should see a reasonable distribution of support to different forms of research. But the limitation of this form of support is that the machinery of securing the funds may become effective more rapidly than the organization to expend them, and the desire for specific results may exceed the probable returns. A better procedure than usually characterizes public subscriptions would be for each of the specialist societies to nominate research councils entrusted with the expenditure of funds collected by public subscription.—Gregg, Alan: *The Furtherance of Medical Research*, New Haven, Conn., Yale University Press, 1941.

AIR EMBOLISM IN ARTIFICIAL PNEUMOTHORAX

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Of all the complications of artificial pneumothorax therapy, air embolism is the most alarming and most dangerous. Its occurrence is sudden and without preceding signs or symptoms, as it is in reality an accident. Its results either are instantaneous or appear in a short time.

Rogers, while irrigating the empyema cavity of a small girl in 1864, observed an attack characterized by pallor, unconsciousness and clonic convulsions with recovery after twenty-four hours. While diagnosed as pleural eclampsia it may be logically assumed from the description of the attack that this was a case of cerebral air embolism.

Brandes¹ in 1912, while attempting to outline an empyema cavity with bismuth paste, accidentally demonstrated the mechanism of air embolism. On injection of the paste, the patient became unconscious and was suddenly seized with fatal convulsions. On postmortem examination bismuth was found in the vessels of the cerebral cortex and brain stem.

AIR EMBOLISM IN PERIPHERAL CIRCULATION

Every physician and intern who has given intravenous injections knows that often small quantities of air have been introduced into the peripheral veins with no untoward effect.² This can be explained on the basis that the amount of air injected was small and its injection into the circulation slow. This allowed for its absorption in the vascular lung tissue. Thus, 3,910 cc. of air was injected slowly into a dog over a period of eighty-seven hours before death occurred.³

On the other hand, fatal air embolism does occur during operations on the neck and in manual loosening of placentas. Here the quantity of air admitted is large and its entrance into the circulation rapid. Experimental work has shown that the fatal dose of air for a 150 pound (68 Kg.) man would be about 525 cc., if injected rapidly into the peripheral circulation.⁴ Death is the result of failure of the right side of the heart due to blocking of the pulmonary circulation and interference with ventricular output of the heart due to air bubbles.⁵

PHYSIOLOGY

Curtillet,⁶ in experimental work on animals, has shown that air bubbles do not reach vessels of a caliber of less than 30 microns; that is to say, they never reach capillaries. Arrested in the endarterioles of 30 to 40 microns in diameter, they are rapidly absorbed. Air and oxygen are absorbed at about equal rates of speed. Carbon dioxide is absorbed more rapidly than either. Air bubbles injected into the peripheral circulation, barring such anatomic defects as a patent foramen

From the Texas Tuberculosis Sanatorium, Sanatorium, Tom Green County, Texas.

1. Brandes: München, med. Wehnschr. 59: 2392, 1912.
2. Reyer, G. W., and Kohl, H. W.: Air Embolism Complicating Thoracic Surgery, J. A. M. A. 87: 1626 (Nov.) 1926.
3. Richardson, H. F.; Coles, B. C., and Hall, D. E.: Experimental Gas Embolism, Canad. M. A. J. 36: 584 (June) 1937.
4. Moore, R. M., and Braselton, C. W.: Experiments in Gas Embolism, Bull. John Sealy Hosp. & Sch. of Med. 1: 78 (May) 1937.
5. McDaniel, Shaw: Air Embolism: Its Cause and Treatment, D. J. of Chest 7: 146 (April) 1941.
6. Curtillet, E.: Arterial Air Embolism, J. de chir. 53: 461 (Apr.) 1939.

ovale or a ductus arteriosus, are completely filtered out in the vascular system of the lungs and are never found in the vulnerable arterial circulation.

AIR EMBOLISM IN ARTERIAL CIRCULATION

It has been demonstrated that the injection of moderate amounts of air into a systemic vein leads to embolism of the smaller vessels of the lung with no harmful defects. On the other hand, relatively minute quantities of air injected into the pulmonary vein produce severe reactions or death. This is because the air passes from the vein, through the left side of the heart into the systemic arteries. Experimental work⁷ indicates that the lethal dose of air thus entering the arterial circulation of a 150 pound man is about 37.5 cc. This depends on how rapidly air emboli obstruct vital cerebral or coronary arteries.

From clinical observations it seems that cerebral embolism is the most frequent cause of death in these cases. However, Moore and Braselton, working with cats, found that death occurred from coronary obstruction in every case, regardless of the position of the animal. Within a second or two after injection of air into the animals, air bubbles were seen descending the coronary arteries. The air filled both the left and the right arterial tree. This complete obstruction of the arteries led to extreme dilatation of the ventricles in five to six minutes, though under artificial respiration the animals made convulsive respiratory movements at this time indicating that the respiratory center was still functioning.

Wever⁸ demonstrated by numerous experiments on rabbits, dogs and cats the effects of introducing air directly into the carotid arteries and found that the symptom complex resulting coincides with that sometimes observed in air embolism from pneumothorax therapy. At times he could produce air emboli with less than 1 cc. of air, while on other occasions the injection of 2.3 cc. of air failed to produce symptoms. Depending on the amount of air introduced, he observed variations from mild tremors and mild disturbances of cardiac and respiratory action to sudden death. The milder effects resembled what we believe has been incorrectly termed pleural shock.

AIR EMBOLISM VERSUS PLEURAL SHOCK

Many physicians⁹ still diagnose as pleural shock cases in which the syndrome of pallor, nausea, vertigo, convulsive tremors, coma and temporary blindness is present, with complete recovery.

Schlaepfer¹⁰ carried out a series of experiments on the normal pleurae of various animals. He found that stimulation of a normal pleura by mechanical, chemical, electrical and other stimuli did not produce a constant specific reaction by way of the central nervous system as one would expect if the so-called pleural reflexes were the source of the syndrome mentioned.

Capps⁹ repeated these experiments on dogs with an acute pleurisy produced by intrapleural injections of

turpentine and oil contaminated with bacteria. In some of these cases, stimulation of the inflamed visceral pleurae produced no decided change in blood pressure. In others there was a considerable fall of blood pressure, which was sometimes fatal. Capps also stated that during aspirations of pleural effusions in human beings he had purposely irritated the visceral pleura with the end of a trocar and had observed a significant fall of blood pressure. During several hundred aspirations of simple pleural effusions and tuberculous empyemas at the Texas Sanatorium, we have frequently either punctured or scratched the moving visceral pleura with the trocar. In none of these cases have we ever observed syncope or a significant fall of blood pressure from irritation of the visceral pleura.

Introduction of the trocar through the parietal pleura without anesthesia produces excruciating pain; however, after the trocar has pierced and anesthetized the parietal pleura, it may pierce or scratch the visceral pleura without producing any perceptible sensation of pain or discomfort. Shaw¹¹ states that during several hundred intrapleural pneumolyses and thoracoscopies of the chest, both with and without manipulation of the visceral pleura, he has never observed a case of pleural shock or air embolism. During these intrapleural pneumolyses adhesions are severed by the actual cautery, at times while work is being done close to both the parietal and visceral pleurae. If such a mechanism of pleural reflexes through the central nervous system existed, the mechanical and thermal stimulation of intrapleural pneumolyses should certainly produce pleural shock. Apparently the absence of reactions in these cases is due to the fact that the visceral pleura and lung are never actually pierced and there is no chance for cerebral air embolism to occur.

PATHOLOGY

It is often impossible to obtain pathologic-anatomic proof in fatal cases of air embolism because of the fact that minimal and undemonstrable air bubbles introduced in the carotid arteries often cause death.¹² Frequently, however, at autopsy air bubbles have been found in the cerebral vessels of fatal air embolism cases.

Spielmeier¹³ has reported that the first demonstrable pathologic changes in the brain appear about fifteen hours after the air is injected and consist of a beginning liquefaction of brain cells and the encrustation of the fine nets around the ganglion cells. After three to five days, proliferation of glia cells at the site of the diseased nerve cells is very pronounced. These changes are predominantly in the form of islands and there are no bleedings or necrotic softening. About twelve days after the air embolism occurs, large glia cells are seen at the place of the disintegrated cortex cells.

Air embolism is more apt to occur in the pathologically altered lung than in the normal lung because, in the presence of induration and adhesions in the former, vascular contractility is impaired. In the infiltrated portion of the tuberculous lung the pulmonary veins are kept stretched in the rigid tissues and cannot evade the needle as in the healthy tissues. Should the needle injure such a vein, its walls cannot collapse as they would normally.⁸ It is evident that, when to such

7 Moore, R. M., and Braselton, C. W.: *Ann. Surg.* 112: 212 (Aug.) 1940.

8 Wever: *Cerebrale Luftembolie*, *Beitr. z. Klin. d. Tuberk.* 31: 159, 1914.

9 Capps, J. A.: *Air Embolism versus Pleural Reflex as the Cause of Pleural Shock*, *J. A. M. A.* 109: 852 (Sept. 11) 1937. Neppi, A. D.: *Pleural Edema During Artificial Pneumothorax*, *Am. Rev. Tuberc.* 43: 295 (Feb.) 1941. Cooke, C. H.: *Pleural Shock*, *ibid.* 24: 545 (Nov.) 1931.

10 Schlaepfer, K.: *Air Embolism Following Various Diagnostic or Therapeutic Procedures in Diseases of the Pleura and Lung*, *Bull. John Hopkins Hosp.* 33: 321 (Oct.) 1922.

11 Shaw, Robert: Personal communication to the authors.

12 Kowitz: *Luftembolie oder Pleurashock*, *Beitr. z. Klin. d. Tuberk.* 50: 374, 1922.

13 Spielmeier, quoted by Pollak, Maxim: *Air Embolism*, *Am. Rev. Tuberc.* 28: 187 (Aug.) 1933.

an injury a negative pulmonary venous pressure of —7 to —8 cm. of water is added, air may be sucked into such an injured vein from the needle tubing, from the lung alveoli or from the pleural cavity itself. It is not necessary that air should be introduced into the vessel from the outside to produce air embolism.

INCIDENCE

Among 1,869 cases of pneumothorax reported in the literature¹⁴ there occurred 43 cases of air embolism. This is an incidence of 2.3 per cent, or 1 in every 43 cases of pneumothorax. Among 126,547 pneumothorax treatments reported¹⁵ there occurred 96 cases of air embolism. This is an incidence of 0.0758 per cent, or 1 during every 1,318 pneumothorax treatments. Among 142 cases in which the mortality was reported¹⁶ there were 41 deaths. This is a mortality of 28.8 per cent for all cases of air embolism.

At the Texas Sanatorium during the past twenty-three years 115,380 pneumothorax treatments have been given with 19 cases of air embolism. This is an incidence of 0.016 per cent, or 1 air embolism in every 6,073 pneumothorax treatments. During this period in which 19 air embolisms occurred there were 3,036 pneumothorax patients receiving treatments. This is an incidence of 0.62 per cent, or 1 air embolism in every 159 pneumothorax patients. Among these 19 cases there were 7 deaths, a mortality of 36.8 per cent.

REPORT OF CASES

Among the 19 cases of air embolism occurring at the Texas Sanatorium, a fairly complete record was available in 17 cases:

CASE 1.—R. H., a white man aged 25, a clerk, with no history of exposure to tuberculosis, had influenza in December 1940 with poor recovery, followed by malaise, pleurisy and loss of weight. Gradually he acquired a productive cough and by February was raising 4 cc. of mucopurulent sputum daily. Fever and intermittent hoarseness appeared. On Feb. 20, 1941 he stopped work and began observing regular rest hours. On admission to the sanatorium ten days later, fairly extensive involvement of the upper lobe of the left lung was found with no definite cavitation. He was classified moderately advanced (b), and the sputum contained tubercle bacilli. Left artificial pneumothorax was advised, and the initial puncture of 300 cc. of air was given on March 14 with good manometer readings. Next day 400 cc. of air was given with a final manometer reading of 0, —8 (cm. of water). The third refill was given March 18 at 8:40 a. m. As the pneumothorax needle entered the chest the manometer showed a pressure of plus 6 cm. of water. The needle was manipulated and the manometer showed a reading of —12 cm. A few cubic centimeters of air were given and the reading was —8, a few

more cubic centimeters and the reading was —6, a few more cubic centimeters and the reading was —2. The patient became pale, closed his eyes and rolled forward slightly. He became unconscious, the pupils dilated, and the eyes rolled upward. He made three or four feeble, jerking movements of the left arm and then lay still. Epinephrine hydrochloride and artificial respiration were administered. Irregular pulse beats appeared, and these were followed by several convulsive respiratory movements. At 8:55 a. m. both the heart action and the respiratory movements stopped. In all about 50 cc. of air was induced, and the fatal reaction lasted twelve minutes.

At necropsy the left lung was almost completely collapsed by pneumothorax. A single sheet adhesion extended from the apex to the first rib. Three needle punctures with subpleural hemorrhage were seen in the arteriolateral aspect of the lower lobe. Section of the lung showed that one needle tract passed through a 5 mm. pulmonary vein. No air bubbles could be demonstrated in the coronary or cerebral arteries. The heart was contracted and there was about 1 ounce (30 cc.) of blood tinged fluid in the pericardial sac.

CASE 2.—C. H., a white woman aged 19, a student, with no history of exposure to tuberculosis, suffered from malaise and loss of weight in November 1938, and a slight cough appeared. One year later a diagnosis of tuberculosis was made. On admission to the sanatorium, Nov. 21, 1939, her condition was classified as far advanced (a), with extensive involvement of the upper half of both lungs with a small cavity in the left upper lobe. The sputum contained tubercle bacilli.

The right lung improved steadily, and on July 31, 1940 an unsuccessful attempt was made to collapse the left lung by artificial pneumothorax. On a second attempt two days later, 350 cc. of air was introduced with a final manometer reading of 0, plus 2 cm. of water. On the third refill, March 5, the initial reading was —1, —7 cm. of water; 25 cc. of air was given and the manometer read 0, plus 7 cm. of water. The needle was withdrawn, and the patient rose to a sitting position. She complained of feeling weak and nauseated and immediately had a convulsive seizure of the right arm and leg and became unconscious. Both eyes were deviated to the left side. The head was lowered, and artificial respiration was given. She regained consciousness in about ten minutes but complained of blurred vision and severe headaches for the next twelve hours.

CASE 3.—H. G., a white woman aged 23, a housewife, with no known exposure to tuberculosis, had pleurisy in 1937, and after the birth of a child in September 1939 she had malaise and loss of weight. In May 1940 she became ill with a chill and high fever, and this was followed by a productive cough and expectoration of about 30 cc. of mucopurulent sputum daily. Hoarseness, night sweats and indigestion appeared. She remained in bed until her admission to the sanatorium, June 12, 1940. Her condition was classified far advanced (b), with extensive disease, and multiple cavitations in the left lung. The sputum was strongly positive for tubercle bacilli. Left artificial pneumothorax was advised, and the initial puncture was made on June 17 at 9:20 a. m. On the first puncture the pleural space was not located and there was no oscillation of the manometer. A second puncture was done immediately, and the manometer showed a negative pressure of —4 cm. of water. The air was turned on and off twice. The pressure was still —4, but there was no fluctuation of the manometer on respiration. In all, about 25 cc. of air had been injected when the patient closed her eyes, became pale and slumped forward. She became unconscious, and feeble tonic tremors occurred momentarily in the arms and legs. Epinephrine hydrochloride and artificial respiration were given and the head was lowered. The patient improved for a minute and was able to talk. She then became unconscious again. The respiration was gasping and convulsive and the pulse was irregular. The condition rapidly grew worse and the heart action ceased at 9:46 a. m. despite artificial respiration. There was no necropsy.

CASE 4.—E. T., a white man aged 27, a café manager, had been exposed to a tuberculous father. In March 1939 malaise

14. Forlanini: Gazz. d. osp., November 1882. Myers, J. A.; Levine, Ida, and Leggett, Elizabeth A.: Air Embolism and Spontaneous Pneumothorax Complicating Artificial Pneumothorax, Brit. J. Tuberc. 31: 77 (April) 1937. Andrews, C. H.: Cerebral Air Embolism Complicating Artificial Pneumothorax, Am. Rev. Tuberc. 22: 435 (April) 1931. Sacks, quoted by Cocke.⁹

15. Bruns, E. H.: Air Embolism As a Complication in Artificial Pneumothorax Therapy, Colorado Med. 27: 237 (May) 1930. Tice, Frederick, and Hruby, A. J.: Collapse Therapy at Chicago Municipal Tuberculosis Sanatorium, J. A. M. A. 113: 101 (July) 1939. Sang-tuberculosis Beitr. z. Klin. d. Tuberk. 31: 571, 1914. Motz, P. B.: Am. J. Man. Sc. 176: 87 (July) 1928. Stivelman, B. P.: Am. J. M. Sc. 145: 6, 1923. Cocke.⁹ Forlanini.¹⁴ Andrews.¹⁴

16. Warring, F. C., and Thomas, R. M.: Spontaneous Air Embolism, Am. Rev. Tuberc. 42: 682 (Nov.) 1940. McCurdy, Thomas: Air Embolism Complicating Artificial Pneumothorax, ibid. 30: 88 (July) 1934. Bishop, H. A.: Air Embolism and Artificial Pneumothorax, ibid. 10: 591 (Jan.) 1925. Schattenberg, H. J., and Ziskind, Joseph: Air Embolism as Complication of Artificial Pneumothorax, Am. J. Clin. Path. 9: 477 (July) 1939. Walsh, Frank B., and Goldberg, H. K.: Blindness Due to Air Embolism: A Complication of Extrapleural Pneumolysis, J. A. M. A. 114: 654 (Feb.) 1940. Hall, W. E. B.: Left Heart Arterial Air Embolism, ibid. 109: 125 (July) 1937. Reyer and Kohl: Spidmeyer.¹² Myers, Levine and Leggett.¹⁴ Andrews.¹⁴ Bruns.¹⁵ Tice and Hruby.¹⁵

and slight expectoration appeared. On entering the sanatorium on May 10, 1939 he was classified as having moderately advanced (c) tuberculosis, showing extensive involvement of the left lung with cavitation in the upper lobe of the left lung. The sputum contained tubercle bacilli. Left artificial pneumothorax was advised and 350 cc. of air was given at the initial puncture on May 17. The eighteenth refill of 300 cc. was given on July 21, with an initial reading of 0, —8, and a final reading of 0, —4 cm. of water pressure. The patient felt a moderate pain in the left chest but walked back to his room. Here he became nauseated, dizzy and developed blurred vision and headache. The blurred vision and headache lasted for fifteen hours, when complete recovery occurred.

CASE 5.—J. B. B., a white man aged 27, an oil field worker, with no known exposure to tuberculosis, suddenly had a massive hemorrhage on March 10, 1939. He was given right artificial pneumothorax and went back to work immediately. In August 1939 he began streaking again and this time was given pneumothorax on the left side. He observed no rest hours prior to his admission to the sanatorium on September 17. His condition was classified as moderately advanced (a); there was bilateral cavitation in both apices. The sputum was positive for tubercle bacilli, and there was an anal fistula. Bilateral pneumothorax was continued, and on October 11 the pneumothorax needle was induced into the right chest. Before any air could be given the patient complained of blindness, nausea, chilly sensations, and pains in both arms and the right chest. The needle was withdrawn, and the head lowered. The patient became semiconscious, and tonic contractions of both arms appeared. Little blue cyanotic blotches about 1 cm. in diameter appeared over the right anterior chest and right arm and lasted for about fifteen minutes. Severe headache, nausea and blurred vision continued for twelve hours, followed by complete recovery.

CASE 6.—L. C. L., a white man aged 58, a salesman, with no known exposure to tuberculosis, acquired malaise and loss of weight in March 1937, and two months later a diagnosis of pulmonary tuberculosis was made. On admission to the sanatorium, Aug. 11, 1937, his condition was classified as far advanced (a), showing extensive involvement of the left lung with cavitation and an apical lesion of the right lung. The sputum contained tubercle bacilli. He failed to improve on bed rest, and left pneumothorax was advised. The initial injection of 400 cc. of air was given on September 15, with poor manometer readings. Two days later a second refill of 200 cc. of air was given. On September 20 the pneumothorax needle was induced for a third refill. As the needle entered the pleura there was a manometer reading of —3 cm. of water, but no air was injected. The patient complained of nausea and dizziness. He became unconscious, and clonic and tonic convulsions appeared. The head was lowered, and epinephrine hydrochloride was given. The patient regained consciousness for about one minute, but this was followed by another convulsion. He became cyanotic, and irregular respiration followed; the pulse was regular. Artificial respiration and caffeine with sodium benzoate were given, but the convulsions became worse and the patient died after a reaction of about thirty minutes. No necropsy was performed.

CASE 7.—Mrs. M. W., a white woman aged 25, a housekeeper, whose husband died of tuberculosis in 1925, had malaise, cough and expectoration in October 1935. She entered the sanatorium on Feb. 25, 1936 and her condition was classified as far advanced (b). There was a very extensive involvement of the left lung with an apical lesion of the right lung. The sputum was positive for tubercle bacilli. Left artificial pneumothorax was advised, and the initial injection of 250 cc. of air was given on March 4, 1936. Two days later an attempted refill was unsuccessful because of inability to find the pleural space. Later, on the third attempt to give a refill, the pleural space again could not be located, and after some manipulation the needle was withdrawn. The patient immediately complained of vertigo and nausea. She became unconscious and had generalized convulsions. The head was lowered, and

epinephrine, caffeine and artificial respiration were given. The convulsions increased in severity and occurred more often. The heart beat regularly for sixty minutes and then became irregular and stopped in five more minutes. No necropsy was performed.

CASE 8.—A. L., a white man aged 42, a farmer, had malaise and bloody expectoration in 1922. On admission to the sanatorium, Sept. 3, 1924, his condition was classified as far advanced with total fibrocavernous involvement of the left lung and scattered small lesions over the right lung. The sputum contained tubercle bacilli. Left artificial pneumothorax was begun on November 24 with poor manometer oscillations. The fifth refill was given on December 8. After 50 cc. of air had been injected the patient became unconscious, and generalized convulsions followed. Morphine and epinephrine were given, but the convulsions became more severe, and death occurred in thirty minutes.

CASE 9.—M. W., a white woman, a housewife, had taken pneumothorax in the sanatorium for six months and had been discharged for ambulatory treatment. On a subsequent refill the pneumothorax needle was introduced and about 200 cc. of air had been given. Suddenly the patient became limp and rolled forward unconscious. A few quivering twitches passed through the body, but there was at no time any type of convulsion. The pulse was weak and irregular and soon became imperceptible. The heart ceased beating in about five minutes.

CASE 10.—J. L. D., a white woman aged 30, a housewife, had taken artificial pneumothorax therapy for slightly more than two months, when the needle was introduced for the tenth refill. The manometer showed unsatisfactory oscillations and after 100 cc. of air showed a positive pressure. The needle was withdrawn, and the patient arose to a sitting position. She immediately complained of vertigo and nausea and lay down on the operating table. She became unconscious and was seized by tonic convulsions and lost control of the urinary sphincter. The head was lowered and artificial respiration was applied. Consciousness returned in about ten minutes, but at this time she complained of severe headache and blurred vision. The right pupil was dilated for eight hours and the right side of the face showed the presence of a spastic paralysis for twenty-four hours. The headache remained for forty-eight hours, during which time the foot of the bed was kept elevated.

CASE 11.—T. B., a white woman aged 24, a nurse, had taken artificial pneumothorax therapy for about one year with poor manometer fluctuations, when the needle was induced for a refill. The operator was unable to locate the pleural space, and after some manipulation the needle was withdrawn. Immediately the needle was induced again through the next higher interspace. The manometer showed a negative pressure of —4 cm. of water, but the patient complained of nausea and faintness, and the right pupil became dilated. The patient became semiconscious for two or three minutes, and the pupil remained dilated for about ten minutes. A severe headache lasted for twelve hours, followed by complete recovery.

CASE 12.—Y. R., a woman aged 21, Mexican, a housewife, during the fifteenth refill on Nov. 18, 1940 complained of severe pain at the site of induction of the needle. The manometer showed a negative pressure of —6 cm. of water. After 25 cc. of air had been induced the manometer showed a positive pressure. The patient became limp, unconscious and cyanotic. The respiration was irregular and gasping for five minutes and then became regular. The patient became conscious but complained of feeling weak and faint for the next ten hours.

CASE 13.—M. B., a white woman aged 25, a housewife, had taken artificial pneumothorax therapy with good manometer oscillations for eight weeks. On the tenth refill, after about 50 cc. of air had been introduced, the patient suddenly was seized with severe tonic and clonic convulsions. Bloody, frothy mucus came from the mouth and nose. The patient bit her tongue several times and attempted to swallow it. Artificial respiration and epinephrine were given. The patient remained unconscious for two hours, during which time recurrent convulsions occurred and rectal and bladder sphincter control was

lost. At the end of this period the patient complained of blurred vision for the next twelve hours. Severe headaches persisted for the next three days.

CASE 14.—A white woman aged 23, a housewife, had received artificial pneumothorax therapy for eight weeks. On the eleventh refill the operator had trouble locating the pleural space but after some manipulation of the needle secured a manometer reading of -8 cm. of water. After 100 cc. of air had been given the patient became pale and unconscious and was seized with generalized convulsions. She uttered loud groaning sounds, vomited several times, and blood tinged, frothy saliva came from the mouth. The patient was given epinephrine and artificial respiration, but the convulsions became more frequent and severe, and the patient died in twenty-five minutes without becoming conscious. No necropsy was performed.

CASE 15.—A woman aged 35 had been receiving artificial pneumothorax therapy for three weeks. On the fifth treatment the manometer showed a negative pressure of -8 cm. of water. After 125 cc. of air had been induced, the patient became pale and unconscious. The needle was withdrawn and the end was blood tinged. Generalized clonic convulsions followed; the patient became cyanotic and swallowed her tongue. The pulse was imperceptible, the respiration gasping and convulsive. Epinephrine, ammonia and artificial respiration were given. The patient became conscious in fifteen minutes but complained of blurred vision and severe headaches for three days.

CASE 16.—A woman aged 28 was receiving artificial pneumothorax on admission to the sanatorium in May 1926. On the seventh pneumothorax treatment in the sanatorium she suddenly became unconscious after 100 cc. of air had been given. The needle was withdrawn and the tip was blood tinged. The patient was limp and pale, and no pulse was palpable. The respiration was irregular. Epinephrine and artificial respiration were given. The patient became conscious in ten minutes but complained of exhaustion and nausea for the next twelve hours.

CASE 17.—A white woman aged 27 had a tuberculous empyema. During aspiration and irrigation of the empyema cavity she suddenly complained of weakness, vertigo and severe pain over the precordium and down the left arm. She was semiconscious for about five minutes and uttered loud groaning noises. For twenty-four hours she complained of precordial pains, pain and numbness in the left arm and blurred vision.

TREATMENT

Treatment of air embolism consists in prophylactic and therapeutic measures. Prophylaxis deals mainly with the technic employed in giving artificial pneumothorax treatments. A thorough study by roentgen ray and fluoroscopic examinations will show areas of consolidation, adhesions and cavitation near the periphery of the lung and will guide the operator away from these dangerous areas. The pneumothorax needle should be introduced attached to a syringe of procaine hydrochloride. In this way, once the needle has penetrated the parietal pleura, air can be drawn back freely into the syringe whereas, if the needle has penetrated the lung or an adhesion or is in a blood vessel, on retraction of the syringe plunger frothy blood tinged fluid or blood will be withdrawn. If air bubbles obtained are from the lung they are usually blood tinged and difficult to withdraw. Unless the needle aspirates air freely it should be withdrawn immediately and another puncture site selected. The introduction of the needle should be direct and with as little manipulation as possible.

During refills, free manometer oscillations should be obtained before air is introduced.

If the patient complains of severe pain, nausea or vertigo or other symptoms common to air embolism, the needle should be withdrawn and the patient's head lowered for at least ten minutes.

Once air embolism has occurred, the quicker the air bubbles can be removed from the coronary and cerebral circulation the better the prognosis. Small air bubbles are absorbed spontaneously in a period of ten to twenty minutes, and, if the patient can be kept alive by artificial respiration and stimulants until absorption of the air occurs, recovery will follow. The head should be lowered to an angle of 30 degrees to prevent further cerebral embolism. Epinephrine hydrochloride and caffeine with sodium benzoate are circulatory and respiratory stimulants and aid the circulation in dispersing the air bubbles.

In the event of impending respiratory failure, artificial respiration is necessary.

The head of the patient's bed should be kept lowered for at least half an hour after cessation of symptoms.

Carbon dioxide¹⁷ has been advocated as a substitute for air in the initial and first few pneumothorax treatments. It is absorbed much more rapidly than air and consequently is of less danger if embolism occurs.

SUMMARY

1. Of the 17 cases reported, 10 cases—2, 4, 5, 6, 7, 8, 10, 11; 13 and 14—were apparently due to cerebral air embolism. These were characterized by pallor, partial or complete loss of consciousness, and residual headaches and blurred vision. Among these cases there were 4 fatalities.

2. Five cases—1, 3, 9, 12 and 16—were apparently due to coronary air embolism and presented the symptoms of unconsciousness, cyanosis, irregular heart action, absence of convulsive seizures and presence of convulsive gasping respiratory movements. Three of the 5 patients died.

3. Two cases—15 and 17—presented symptoms of both coronary and cerebral embolism. Neither reaction was fatal.

4. In 9 cases the reaction occurred during the process of inducing air, in 4 cases after the needle was removed, in 3 cases before air was given and in 1 case during the aspiration of pleural fluid.

5. The amount of air induced before the reaction varied from none to 300 cc.

6. The number of air emboli on the various pneumothorax treatments was as follows: one on the first, four on the third, two on the fifth, one on the seventh, two on the tenth, one on the eleventh, one on the fifteenth, one on the eighteenth, three after many treatments, and one during aspiration of an empyema cavity. Half of the air emboli occurred on or before the tenth pneumothorax treatment.

7. The symptoms and signs of air embolism are pallor, dizziness, blurred vision, papillary dilatation and failure to react, ocular deviation, nausea, unconsciousness, tonic and clonic convulsions, mottling of the skin, air bubbles in retinal vessels, paresthesia, precordial pain, irregular respiration, abnormal heart action and residual headache.

8. Clinically, cerebral air embolism seems to occur more often than coronary embolism, but in 35 cats air induced in the pulmonary vein caused death by coronary occlusion without exception.

9. Among the 17 patients who had air embolisms, 11 had adhesions and poor compressions, 5 had good compressions, and 1 reaction occurred on the initial puncture.

17. Moore, R. M., and Braselton, C. W.: An Experimental Study of the Embolic Effects of Air and of Carbon Dioxide, *South. Surgeon* 9: 733 (Oct.) 1940.

CONCLUSIONS

1. Air embolism occurs more frequently in patients with adhesions and poor compressions. Half occur during the first ten pneumothorax treatments.
2. An air embolus occurs once on an average among every 79 pneumothorax patients, an incidence of 1.3 per cent, and once among every 2,104 pneumothorax treatments, an incidence of 0.047 per cent.
3. The mortality from air embolism is about 29 per cent.
4. The treatment consists in lowering the patient's head and giving artificial respiration and stimulants, as epinephrine hydrochloride and caffeine with sodium benzoate.

Clinical Notes, Suggestions and New Instruments

A DEFINITE AND UNIQUE OCCURRENCE OF RAPIDLY FATAL INFECTION CAUSED BY *BACILLUS VIOLACEUS MANILAE*

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Considerable skepticism is extant regarding the pathogenicity of *Bacillus violaceus*. It has been generally considered as a nonpathogenic saprophyte having a rather ubiquitous distribution. More careful perusal and consideration of the sparse literature pertinent to this subject reveals, however, that much of the doubt is due to failure of recognition of the fact that many distinctive species exist in the group of which *Chromobacterium violaceum* is the type species. For a comprehensive classification of this group as regards both the cultural and the pathogenic aspect, the reader is referred to the presentation of Ford.¹

Woolley² identified by pathogenicity and by other specific biologic reactions a species of this group producing fulminating fatal infections in the caribao, or water buffalo, which he termed *B. violaceus manilae*.

In the 2 human cases recorded, one by Black and Shahan³ and the other by Soule,⁴ the durations of illness were of nine and fifteen months respectively. In the report of Black and Shahan the patient had seemingly recovered after approximately two months but in the later report of Soule it is stated that the patient of Black and Shahan died after about nine months. The patient of Soule was sick for approximately fifteen months and, although the micro-organism had been obtained in culture from the cervical adenitis present, it was not considered as the cause of the illness until necropsy. *B. violaceus* was then recovered from the heart's blood and the lesions present in the various organs, and its etiologic role appeared established.

The causative micro-organism concerned in the present report conformed in all respects to *B. violaceus manilae*. Certain experimental aspects of the results obtained have already been reported⁵ and the subject matter in extenso is also to be published.

In the present case there occurred a definite invasion of the micro-organism with resultant septicemia and ensuing death within a week. No other factors were present whereby confusion or doubt could arise relative to the causation of illness and death.

REPORT OF CASE

C. M., a Negro youth aged 21 years, admitted to Charity Hospital on Aug. 31, 1940, was lethargic and incoherent, so that no satisfactory history was obtainable from him. His sister stated that on Aug. 29, 1940 it was noticed that he was limping on his right foot and it was thought that he had a thorn in it. She said that he had attempted to remove the thorn with his knife. When he arose the next morning he complained of headache and of pain in the right leg. He appeared "feverish" and after a hard chill he was brought to the hospital.

The patient was well developed and nourished. He was delirious and in moderate pain. The temperature was 104.2 F., the pulse rate 112, the respiratory rate 36 and the blood pressure 86 systolic and 72 diastolic. Examination of the head, neck, chest, abdomen and external genitalia showed nothing abnormal. A small abrasion was noted on the sole of the right foot with accompanying tenderness of the entire right leg. There was diffuse tenderness in the right inguinal region, wherein enlarged, firm, nodular inguinal lymph nodes were palpable. Blood counts showed 3.92 million red blood cells and 26,900 white blood cells. Urinalysis and the blood Wassermann reaction were negative. Blood urea, uric acid and dextrose were within normal limits. Blood cultures were taken which after four days yielded heavy growths of *B. violaceus*. Blood agglutinations for tularemia, typhoid, paratyphoid and bacillary dysentery were negative. During the five days in the hospital the patient's temperature ran between 104 and 105 F. excepting the day before death, when the temperature dropped to 102.5 F. The pulse rate varied from 112 to 140 and the respiratory rate from 22 to 60.

On the fourth day after admission to the hospital the patient had signs of diffusely consolidated areas in the lungs and expectorated blood tinged sputum. His scleras became icteric. The terminal picture was one of pyrexia and circulatory collapse ending in death seven days after onset of symptoms and five days after admission to the hospital.

Treatment consisted of the administration of tetanus anti-toxin, sulfanilamide, infusions of 10 per cent dextrose solution, transfusions of citrated whole blood, sedation, fluids and oxygen.

At necropsy the body measured 175 cm. in length and weighed approximately 180 pounds (81 Kg.). The pupils were round and equal and measured 6 mm. in diameter. The scleras were deeply icteric. Extensive dental caries was seen, with evidence of poor oral hygiene. No unusual cervical or axillary adenopathy was noted. The thorax and abdomen were normal. No scars or lesions of any sort were seen about the external genitalia or perineum. The inguinal lymph nodes on the right side were enlarged, firm and discrete; the nodes on the left showed no gross abnormalities. Both lower extremities were symmetrical, and no edema or swelling could be detected. On the ball of the right foot, just posterior to the fifth metatarsophalangeal junction, there was a superficial area of denudation

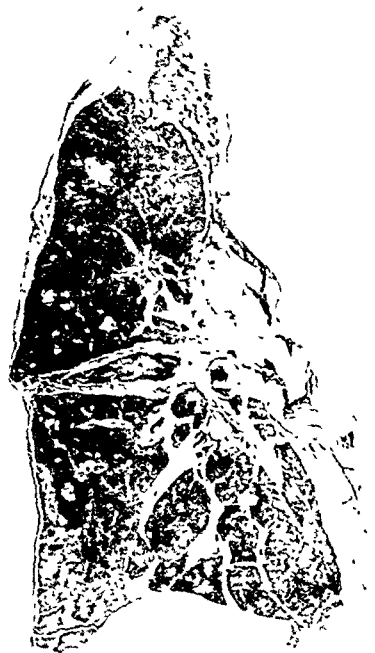


Fig. 1.—Longitudinal section of lung showing scattered foci of necrosis of irregular shape and size, more numerous in the upper lobe.

Aided by a grant from the David Trautman Schwartz Research Fund. From the Department of Pathology of Tulane University School of Medicine and the Tulane Service of the Charity Hospital of Louisiana.

1. Ford, William W.: *Textbook of Bacteriology*, Philadelphia, W. B. Saunders Company, 1927, p. 468.

2. Woolley, P. G.: *Bull. Johns Hopkins Hosp.* 16: 89, 1905.

3. Black, M. E., and Shahan, John: *Bacillus Violaceus Infection in a Human Being*, J. A. M. A. 110: 1270 (April 16) 1938.

4. Soule, M. H.: *Am. J. Path.* 15: 392 (Sept.) 1939.

5. Schittenberg, H. J.: *Proc. Soc. Exper. Biol. & Med.* 45: 829 (Dec.) 1940. Schittenberg, H. J., and Brown, D. V., *ibid.* 46: 478 (March) 1941.

of the cornified epithelium measuring 2 by 2 cm. No especial inflammatory reaction was present surrounding this area. The abdominal cavity presented no gross abnormalities. The pleural cavities contained 20 to 25 cc. of serosanguineous fluid. There were numerous firm fibrous adhesions on the right side between the parietal and visceral pleurae. The heart weighed 340 Gm.

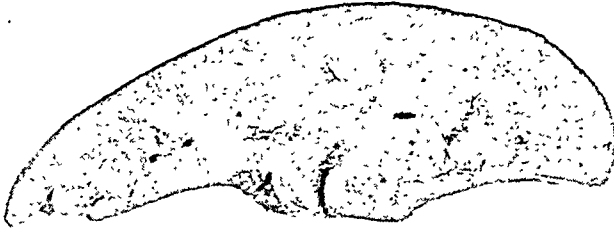


Fig. 2.—Sectioned surface of liver in which are seen four white foci of necrosis.

The myocardium was of good tone throughout. The heart valves were normal. The right lung weighed 840 Gm., the left 640 Gm. Just beneath the pleural surfaces of both lungs were numerous elevated yellowish areas measuring from 2 mm. to 1.5 cm. (fig. 1). On palpation these areas were found to consist of irregularly rounded firm nodules. Such nodules were likewise felt deeply throughout all lobes. On cut section these lesions stood out from the normal lung tissue and on pressure exuded a small amount of milky fluid. No areas of cavitation or liquefaction were noted. The bases of both lungs appeared to be the most heavily involved portions. The spleen weighed 500 Gm. and was of a uniformly firm consistency. On cut section the pulp was found to be dark red and very friable; it scraped away easily on the knife. The liver weighed 1,920 Gm. Scattered over its surface were numerous oval yellowish areas varying from 1 to 5 mm. in diameter. On sectioning through the liver substance numerous similar lesions were found deeper in the organ (fig. 2), some of which appeared to have undergone softening with formation of a thin creamy brown fluid. A few areas as large as 1 cm. in diameter were seen which were yellowish and of increased firmness but somewhat poorly demarcated. The pancreas weighed 160 Gm. and appeared normal. The gastro-

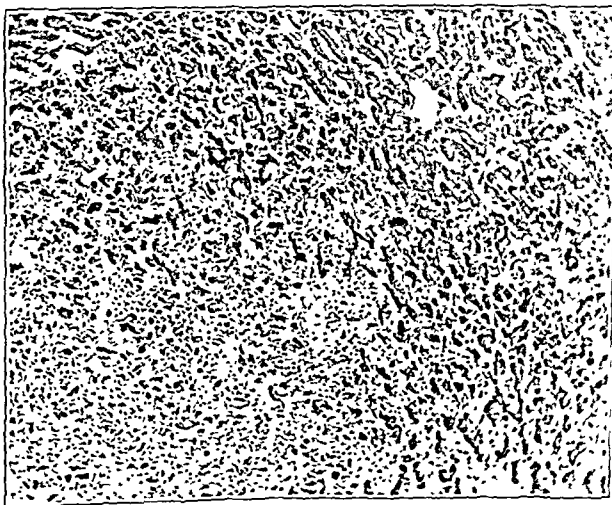


Fig. 3.—Section of peripheral portion of necrotic focus in liver shown in lower left portion. Extensive necrosis of liver cells are shown with but little cellular reaction.

intestinal tract presented no gross abnormalities. The right kidney weighed 140 Gm., the left kidney 170 Gm. Both showed only slight swelling and congestion grossly. The brain presented nothing noteworthy on gross inspection. On dissection and inspection of the inguinal lymph nodes on the right it was observed that they measured from 0.5 to 4 cm. in diameter.

They were fairly discrete and were but slightly adherent to the surrounding structures. They were dark gray, and on palpation evidence of fluctuation could be detected. On section a small amount of dark gray purulent material was found in the necrotic centers of the lymph nodes. The surrounding tissues, including the femoral vein, showed no extension of the inflammatory process.

Cultures were procured from the lesions of the lung, liver, inguinal lymph nodes and the spleen.

The anatomic diagnosis was *Chromobacterium violaceum* bacteremia with abscess formation in liver, lungs and spleen, bronchopneumonia; acute hepatitis; acute splenitis; acute lymphadenitis.

Bacteriologic examination revealed growths of *B. violaceum* in all cultures. These were eventually identified as *B. violaceum* *manilae* (Woolley).

In general, the microscopic study of sections of the lesions revealed analogous pathologic changes. In many of these necrosis with little or no cellular response was present (fig. 3). Other foci consisted in greater part of necrosis with varying

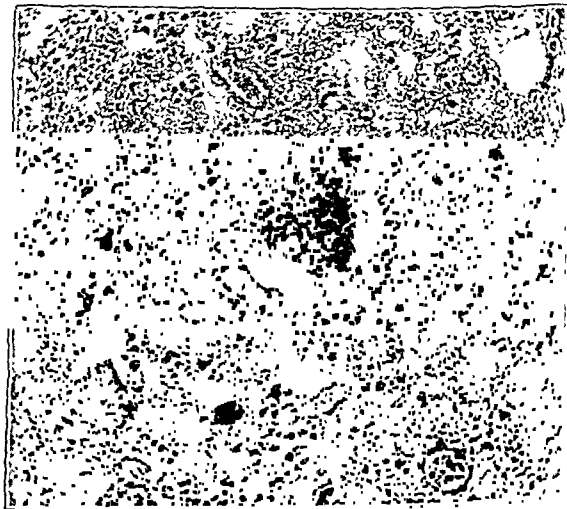


Fig. 4.—Section of lung revealing a central focus of necrosis with surrounding edema of the alveoli.

degrees of cellular and fluid exudate. Serum, red blood cells, neutrophils and lymphoid cells of different amounts were present. In the lungs extensive edema and some hemorrhagic extravasation surrounded the necrotic foci (fig. 4).

COMMENT

While much doubt has heretofore existed as to the pathogenicity of *B. violaceum* for the human subject, a review of the present case reveals a definite fulminant, fatal infection caused by this micro-organism. The facts presented are an illness of brief duration with a history of likely exposure to infection, a septicemia with positive blood culture, resultant death and recovery of the micro-organism from the visceral lesions. It is also to be noted that no associated source of confusion by other infection or disease existed.

The proved pathogenicity for lower animals both by injection and by experimental splinter routes of infection have previously been reported.²

The continuity of clinical and experimental evidence supplied through the present case forms an incontrovertible sequence of fatal human infection with *B. violaceum* *manilae*.

We wish to stress the fact that there exists a rather universal acceptance of the predominantly saprophytic varieties of this group with little or no recognition that at least one species is of proved pathogenic nature, namely *B. violaceum* *manilae* (Woolley). Because of this fact it appears probable that when this micro-organism is occasionally recovered in certain infections, although truly the causative factor, it is unjustifiably disregarded.

TULAREMIA IN DOGS

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From the literature on the subject of tularemia we realize that some questions remain undetermined in regard to the susceptibility of certain animals and birds to this disease. For example, it is evident that sufficient evidence has not been produced to place the common dog in the group of susceptible or naturally immune animals. Obviously it can be understood that the material required to study the susceptibility of dogs under natural conditions is not always readily accessible. Consequently investigators interested in this phase of the problem have limited their observations to experimental studies. From the few experimental studies we are given the impression that the dog is only mildly susceptible to tularemia, and other opinions indicate that this animal possesses a natural immunity.

In this communication we are prepared to show that dogs can contract tularemia under favorable natural conditions and that a resultant high agglutination titer for *Bacterium tularensis* can be observed in the blood serum following a comparatively short duration of the disease.

Dr. Edward Francis¹ in all probability carried out the original experimental studies on dogs. In 1927 he fed infected guinea pig tissues to two dogs, one for twenty-one days and the other for twenty-five days. On the forty-second day he performed agglutination tests on the blood serum of the dog fed for twenty-one days and the serum showed a response in a dilution of 1:320. The blood serum of the dog fed for twenty-five days was subjected to agglutination tests after the fifty-third day, and the reaction was positive to a titer of 1:640. Further similar experimental studies were made by Francis in 1934 on 4 dogs that were injected with virulent cultures, 1 of which died of tularemia after fourteen days but the other 3 remained well. The 3 developed antitularense agglutinins of 1:160, 1:640 and 1:1,280 respectively. It is his belief that a dog could not be killed by being fed infected tularemic material but that by enormous dosages of the organism injected subcutaneously an occasional dog will die. He concluded that dogs are only slightly susceptible to tularemia.

The cases in dogs which prompted our investigations were brought to our attention in connection with a human case of tularemia. During a conversation with the patient's brother-in-law on Nov. 15, 1940, one of us (L. F. E.) learned that 3 dogs went hunting with Mr. G. D. and that there was a possibility that the dogs might also be afflicted with tularemia. Our informant minimized the significance of their condition, but the lead gave us the opportunity of investigating the cause of sickness. We wish, therefore, to touch on several salient points of the human case.

REPORT OF CASE

Mr. G. D., a patient of Dr. G. O. Thompson of Alliance, Ohio, went hunting on Nov. 6, 1940, with his 3 dogs. The dogs ran down a rabbit, which they killed. Mr. D. picked up the dead rabbit, tore it in three pieces and gave each dog a portion. The following day, November 7, one of the dogs, the youngest, became ill and on November 8 Mr. D. took this dog to a local veterinarian Dr. George F. Nixon.²

While talking with Dr. Nixon concerning the symptoms of the dogs, Mr. D. expressed the thought that perhaps they had contracted "rabbit fever." Apparently at that time Mr. D. felt normal, or at least he was not aware of having contracted the same infection. According to Dr. Nixon, the 2 other dogs became ill a day or two later and, while none were hospitalized, on examination he found no elevation of temperature but described them as being more or less listless, with little or no appetite.

On November 9, three days after handling the rabbit, Mr. D. became quite ill with chills and fever and on November 11 he was hospitalized. In the hospital when informed that the

2 other dogs were also showing signs of illness, he remarked "Well, that is strange. That rabbit didn't run like a healthy one; maybe it was sick."

From consultant Dr. Perry F. King's record in the hospital, it is easily recognized that Mr. D. was a victim of tularemia, and, as one might expect, the site of his initial infection occurred on the hands. The right hand in this instance showed two lesions of the skin, of a bluish red discoloration. One lesion on the index finger appeared as a large papule.

Blood collected from Mr. D. on November 12 was submitted to the Laboratory Division, Ohio Department of Health, with a request that it be examined for typhoid and undulant fever. Routine agglutination tests for these infections gave negative results. A second specimen taken on November 15, nine days from the date of exposure or six days following the onset of the initial symptoms, was forwarded to us for *Pasteurella tularensis* agglutination test. The blood serum reaction was negative, as were repeated tests for typhoid and *Brucella abortus*.

Although the patient received antitularense serum treatment, he died on the night of November 16, seven days from the date of onset or ten days after exposure to the infection. This, of course, is regarded as a short duration of illness and unquestionably accounts for the failure to obtain a positive *Past. tularensis* agglutination reaction. In other words, while the degree of infection was overwhelming, the time was too short for the development of serum agglutinins.

This case, when considered with respect to the short duration of illness and death, is not without a parallel experience, for it is a matter of record that in 1928 Simpson³ reported a case of tularemia which terminated fatally four days and seven hours after the onset of the illness.

On the information supplied by the patient's brother-in-law we laid plans to obtain blood specimens from the 3 suspected dogs. Dr. Nixon collected the blood and we received the specimens on November 25, nineteen days after the date on which the dogs ate the infected rabbit. It was interesting to note that 4 plus agglutination with *Past. tularensis* antigen was observed in each serum beginning with dilutions of 1:20 to 1:320 inclusive, and 3 plus readings in 1:640. Agglutination was absent in a titer of 1:1,240.

In order to rule out the possibility of nonspecific agglutinations in these dogs' serums, plans were carried out to obtain serum from a sufficient number of presumably normal dogs for control purposes. Dr. Nixon submitted the first control series of 7 specimens between December 2 and 9, all of which were taken from dogs in his hospital. These gave no indication of agglutination response. About the same time we consulted Dr. W. H. Hobbs, of the College of Veterinary Medicine, Ohio State University, for additional control material, and he consented to furnish us with three important series of blood specimens. We emphasized the importance of procuring specimens from dogs owned by hunters or farmers. Our object in making this request was to examine blood from dogs which had the closest contact with game animals, including ticks and fleas. In December 1940, Dr. Hobbs supplied 14 blood specimens and in February 1941 we received 10, a total of 24 specimens. The ages of the dogs ranged from 1½ to 10 years, and approximately twelve different breeds were represented in the group. Six were definitely listed as hunting dogs, 6 were owned by persons living in large cities and 12 belonged to farmers or residents in small towns.

All the control serums were subjected to the same procedure as was the serum in the 3 positive cases, but no evidence of agglutination for *Past. tularensis* was observed in any one of the 24 control specimens furnished by Dr. Hobbs.

At the time the results of the tests on the original 3 dogs were reported to Dr. Nixon it was pointed out that subsequent blood examinations would be essential in order further to substantiate our observations and to learn particularly whether the titer of the serums would show a reduction similar to those found in human cases after a lapse of several months.

3. Simpson, W. M.: Tularemia: Study of Rapidly Fatal Case (Four Days, Seven Hours), *Arch. Path.* 6:553 (Oct.) 1928.

From the Laboratory Division, Ohio Department of Health.

1. Francis, Edward: Personal communication to L. F. E.

2. It was largely through the cooperation received from Dr. Nixon that we were able to carry on the studies presented in this paper, since Dr. Nixon furnished us with the records of the dogs and several series of blood specimens including blood specimens from normal dogs for control purposes.

As one of the concluding steps in this study, Dr. Nixon was asked to collect a second set of specimens from these 3 dogs. On March 28, 1941 we had the opportunity of making the confirmatory observations on these specimens, and, as was to be expected, there was a diminished titer noted in each serum. While the original tests were positive in dilution of 1:640, the highest dilution in which agglutination occurred was 1:80, 2 showing a 1 plus reaction and the third gave no reaction. However, in dilutions of 1:20 and 1:40, 3 plus readings were recorded in all.

The dogs recovered and are alive today. Periodic rechecking of these animals is, of course, highly desirable, and provided the dogs are available we intend to make additional tests of blood specimens.

SUMMARY AND CONCLUSION

1. Evidence is presented to show that dogs may naturally acquire mild tularemia by the ingestion of infected rabbit material.
2. Dogs so infected will develop *Pasteurella tularensis* agglutinins in high titer in less than twenty days.
3. It is suggested that blood specimens from dogs manifesting potential *Past. tularensis* infection be subjected to routine agglutination tests.
4. A man died of tularemia seven days after the onset of illness. The man and his 3 dogs acquired the infection from the same rabbit. The dogs survived.

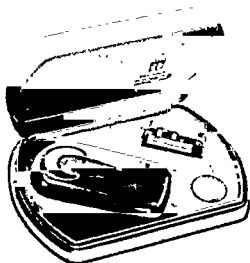
Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

TELEX HEARING AID, MODEL 1020, ACCEPTABLE

Manufacturer: Telex Products Company, 1645 Hennepin Avenue, Minneapolis.

The Telex Hearing Aid, Model 1020, is said by the manufacturer to be essentially the same as the Council accepted Model 612 except for a change in the case.



Telex Hearing Aid, Model 1020.

In the Council examination the device was found to consist of one microphone and amplifier unit, one crystal receiver, one 30 volt B battery W. 20, one 1.5 volt A battery 2 E. S. and one leather battery case. The weight and dimensions of the various parts are given in table 1.

BATTERY DRAIN

The A battery current shown was 90 milliamperes, independent of the setting of the volume control. The B battery current was independent of the volume control setting but showed a variation between 0.5 and 1.0 milliampere, depending on the sound intensity being picked up by the microphone.

TABLE 1.—Weight and Dimensions

	Dimensions, Inches	Weight, Ounces
Microphone and amplifier unit.....	4¼ by 2¼ by ¾	3.86
Receiver	Diameter 1, thickness ¾ inch	0.2 (without earpiece)
Battery case with batteries.....	4½ by 2½ by 1¼	11.8

INTERNAL NOISE

The internal noise is not excessively high. The instrument is provided with an auxiliary gain control, with three settings for controlling feed-back. Using a well fitted earpiece, the volume could be set as high as three fourths of full volume without feed-back when the auxiliary control was set on con-

tacts 1 and 2. Set on contact 3, the volume could be turned full on without feed-back. Acoustical gains were measured with these last named settings of the controls.

ACOUSTICAL GAIN

The figures given in table 2 are typical of the increase in intensity levels at the ear of the subject over that at the microphone as shown by audiometric measurements.

TABLE 2.—Increase in Intensity Levels

Normal Ear Threshold at Microphone		Gain		
Volume setting	128	256-2,048	4,096	
		Min.	Max.	
Full on	None	13	43	14 decibels
	40 Decibels Above Normal Ear Threshold			
Full on	?	15	44	25 decibels

ARTICULATION

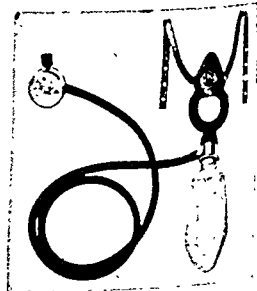
Syllable and sentence tests with hard of hearing subjects gave satisfactory results.

The Council voted to accept the Telex Hearing Aid, Model 1020, for inclusion on the list of accepted devices.

O. E. M. METER MASK ACCEPTABLE

Manufacturer: Oxygen Equipment Manufacturing Company, Inc., 405 East Sixty-Second Street, New York.

The O. E. M. Meter Mask consists of a gum rubber face piece, nasal or oronasal, adjustable head bands, an expiratory flutter valve, a latex collecting bag, an inspiratory check valve, an oxygen percentage meter, a single stage regulator and 4½ feet of rubber tubing. Inhaled atmospheres enter from the latex collecting bag and directly from the supply tubing, past a one way mica flutter valve, thence via the two lead-in tubes of the nasal masks, or through the one lead-in in the case of the oronasal mask. Exhaled atmosphere cannot reenter the collecting bag but leaves through the flutter valve in front of the nose.



O. E. M. Meter Mask.

Oxygen from cylinders or other sources passes first through a small metal chamber, which may be kept entirely closed or partly opened by turning a disk in which are holes of graded size labeled 40, 45, 50, 60, 70, 80, 90 and one position with no hole, marked 95+. These are designed to draw varying amounts of air along with the oxygen as it flows through a jet into the tube supplying the face piece, or no air when the 95+ position is used, closing the metal chamber entirely.

In the Council's examination the apparatus was subjected to the following tests:

A. The nasal mask was worn by a normal human subject for thirty minutes with oxygen flowing at a rate sufficient to keep the collecting bag from collapsing completely on inspiration (7.5 and 8.5 liters per minute) and with the meter disk set at 95+. At the end of this time, through a tube piercing the mask just below the nostrils, a large sample was drawn by several small aspirations at midinspiration. This sample was then analyzed for carbon dioxide and oxygen concentrations by the manometric method of Van Slyke and Peters.

This procedure was repeated, using an oxygen flow of 7 liters per minute with the meter disk set at 90, with 6 liters per minute and disk setting of 80, with 4.3-4.5 liters per minute and disk setting of 60, with 3-3.4 liters per minute and disk setting of 50, and with 2.4 liters per minute and disk setting

of 40. (In each of these tests a large flow of oxygen with the meter disk set at 95+ was first employed for five to ten minutes to wash out the free nitrogen in the lungs before sampling under the conditions just stated.)

B. Since the oronasal mask could differ from the nasal only in the amount of dead space and rebreathing, it was tested similarly for carbon dioxide concentrations only.

C. The fit of the mask about the nose and mouth was investigated by trial and by holding an open bottle of strong ammonia solution closely below the face piece and having the subject inhale deeply.

D. The face piece with exhalation flutter valve and the supply tubing were boiled for three minutes to test the durability of the seal of the valve parts. These and other parts were subjected to prolonged immersion in red mercuric iodide solution, commonly used for short periods for sterilization of nonboilable catheters.

Following are the results of the foregoing tests:

A. NASAL MASK

Meter Disk Setting	Oxygen in Liters per Minute	Oxygen, per Cent	Carbon Dioxide, per Cent
95+	7.5	87.3	0.076
	8.5	96.8	0.000
90	7.0	67.8	0.000
	7.1	63.5	0.400
	7.0	60.8	0.420
80	6.0	69.4	...
	6.0	74.9	0.260
70 (not tested)			
60	4.5	44.6	0.470
	4.3	39.0	...
50	3	42.3	0.073
	3.4	38.3	0.240
40	2.4	42.8	0.000

B. ORONASAL MASK

Meter Disk Setting	Oxygen in Liters per Minute	Carbon Dioxide, per Cent
95+	8.5	0.06
60	4.5	0.26

C. The masks were easy to fit comfortably for prolonged periods when the head straps passed below the ears. No leaks were detected with the strong ammonia vapor.

B. Boiling the face piece for three minutes did not damage it or the exhalation valve. Prolonged immersion in red mercuric iodide did not harm the flutter valve or any other parts.

The Council voted to accept the O. E. M. Meter Mask for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

REPORT OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.
THEODORE G. KLUMPP, M.D., Secretary.

ANTIPNEUMOCOCCIC SERUM (RABBIT) TYPE XIV

The Council has accepted types I, II, IV, V, VII, VIII of antipneumococcic horse serum and types I, II, III, IV, V, VII, VIII of antipneumococcic rabbit serum. Recently one manufacturer (E. R. Squibb & Sons) presented Antipneumococcic Rabbit Serum, Type XIV, and, after reviewing the situation, the Council decided that sufficient evidence now exists to warrant the acceptance of this type. The status of the other types of antipneumococcic rabbit serums, on the clinical use of which experience is accumulating, is at present under review and will be made the subject of a Council report.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

QUININE DIHYDROCHLORIDE.—For standards see the U. S. Pharmacopeia under *Quininae Dihydrochloridum*.

Actions and Uses.—Quinine Dihydrochloride has actions similar to those of quinine, over which it has the advantage of being more soluble in water. It is used where aqueous solutions of quinine are desired, as for parenteral injections.

Intramuscular and especially intravenous administration of solutions of quinine dihydrochloride should be reserved for cases of severe malarial infection in which oral medication is not feasible. In those cases in which intravenous administration is deemed necessary this solution must be diluted to a concentration not greater than 0.5 per cent.

Dosage.—From 0.24 to 1 Gm. ($\frac{3}{4}$ to $15\frac{1}{2}$ grains) intramuscularly or intravenously as indicated by the severity of the symptoms, age and the like.

The Lakeside Laboratories, Inc., Milwaukee.

Ampuls Quinine Dihydrochloride 0.24 Gm. ($\frac{3}{4}$ grains) in 1 cc., 0.49 Gm. ($7\frac{1}{2}$ grains) in 1 cc., 1.0 Gm. ($15\frac{1}{2}$ grains) in 2 cc. (For Intramuscular Use): Each ampul contains the stated amount of quinine dihydrochloride dissolved in distilled water.

Ampuls Quinine Dihydrochloride 0.32 Gm. (5 grains) in 5 cc., 0.49 Gm. ($7\frac{1}{2}$ grains) in 5 cc., 0.49 Gm. ($7\frac{1}{2}$ grains) in 10 cc., 0.65 Gm. (10 grains) in 20 cc. (For Intravenous Use): Each ampul contains the stated amount of quinine dihydrochloride dissolved in distilled water.

ANTIPNEUMOCOCCIC SERUM, TYPE XIV (FROM RABBITS).—An antiserum obtained from the blood of an animal of the genus *Lepus*, containing predominantly antibodies for type XIV pneumococcus (*Diplococcus pneumoniae*).

Dosage.—Average dose, 20,000 to 100,000 units intravenously. The initial and subsequent doses should be administered in such amount and at such intervals as indicated by the condition of the patient, according to the judgment of the physician. With a large initial dose, fewer units may be curative. The Francis cutaneous test (injection of specific pneumococcic capsular polysaccharide) may be used in conjunction with clinical observations to determine adequacy of dosage.

E. R. Squibb & Sons, New York.

Antipneumococcic Rabbit Serum, Type XIV.—It is refined and concentrated by salting out with ammonium sulfate, the globulin fraction being retained. The final product contains merthiolate 1 in 10,000 and 0.2 per cent of phenol. Marketed in vials containing 20,000 units and 50,000 units each. Included in the trade package is a 5 cc. vial containing 0.05 cc. of the same concentrated rabbit serum diluted in 5 cc. of physiological solution of sodium chloride for the sensitivity test.

THIAMINE HYDROCHLORIDE-SQUIBB (See New and Nonofficial Remedies, 1941, p. 551, under Thiamine Hydrochloride).

The following additional dosage forms have been accepted:
Crystals Thiamine Hydrochloride Squibb. Marketed in bottles containing 1 Gm. of crystalline thiamine hydrochloride, equivalent to 333,333 U. S. P. units.

Solution Thiamine Hydrochloride-Squibb, 10 mg. per cc., and 50 mg. per 25 cc. vials. Each cc. contains in addition 5 mg. of chlorobutanol in sterile distilled water.

NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1941, p. 556).

The following dosage form has been accepted:

Ampuls Nicotinic Acid Amide-Breon, 50 mg. in 2 cc. Each 2 cc. contains 50 mg. of nicotinic acid amide in physiological solution of sodium chloride.

Prepared by George A. Breon & Co., Inc., Kansas City, Mo. No U. S. patent or trademark.

NICOTINIC ACID-U. S. P. (See New and Nonofficial Remedies, 1941, p. 555).

The following dosage forms have been accepted:

Ampoules Solution Nicotinic Acid, 10 mg. in Physiological Sodium Chloride Solution, 10 cc.

Prepared by Endo Products, Inc., Richmond Hill, N. Y.

Ampoules Solution Nicotinic Acid, 20 mg. in Physiological Sodium Chloride Solution, 10 cc.

Prepared by Endo Products, Inc., Richmond Hill, N. Y.

Ampoules Solution Nicotinic Acid, 100 mg. in Physiological Sodium Chloride Solution, 10 cc.

Prepared by Endo Products, Inc., Richmond Hill, N. Y.

DEXTROSE (See New and Nonofficial Remedies, 1941, p. 179).

George A. Breon & Co., Inc., Kansas City, Mo.

Ampules Solution Dextrose 50% (W/V), 50 cc. Each ampule contains 50 cc. of a solution containing 25 Gm. of dextrose, U. S. P.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 13, 1941

THE NATION AT WAR

On December 7 the Japanese attacked the United States. On December 8 the President declared a state of war between Japan and the United States; both the Congress and the Senate of the United States adopted resolutions supporting the action of the President. The mustering of the forces of the United States to meet this attack and to carry on warfare to absolute victory places an immediate and tremendous responsibility on the medical profession. By the time this editorial appears, the Selective Service will, no doubt, have intensified its activities to call an additional half million, if not a million, men. For every thousand men called into service, at least six physicians are required.

Fortunately the medical profession has been alert. Since June 1940 the medical profession has been intensively engaged in standardization of military medical procedures, encouragement and promotion of scientific military medical research and enrolment of medical personnel. Already more than twenty-five thousand physicians have given of their services to the Selective Service. Already more than ten thousand physicians are engaged in military medical service. Additional thousands are associated with the United States Army and Navy Medical Corps, the United States Public Health Service, speeded industry and many other military and quasimilitary activities. Moreover, the Office of Civilian Defense has made the medical profession aware of requirements for its services to the civilian population in times of emergency.

Whenever the medical profession has been called on by our government it has responded whole-heartedly and enthusiastically to the Nation's call. Never has there been raised the slightest doubt of the patriotism of the medical profession. Now comes a new opportunity to respond.

The development of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians places on the medical profession the responsibility for supplying the medical personnel necessary to all the services that have been mentioned. The utilization of the roster in the headquarters of the American Medi-

cal Association gives opportunity to supply all the needed officers and, at the same time, to protect the requirements of medical education and the care of the civilian population.

On December 18 the Committee on Medical Preparedness of the American Medical Association will meet in Chicago together with similar committees representing the dental and veterinarian professions to outline the details of the method by which physicians will be called. The state and county committees on medical preparedness will be utilized in developing complete information regarding physicians available for various types of service. Shortly also *THE JOURNAL* will publish a blank on which every physician willing to serve may indicate the special service for which he is immediately available.

The organization has been made ready; the lines of communication are drawn; confusion need not prevail. When the call comes, physicians who are to serve with the military branches will enroll directly through the corps area commander in each corps area and all of the necessary steps will have been taken to facilitate such enrolment. The President of the United States will find the physicians of this nation ready and willing to meet any demands which the nation may place on them.

THE POTENCY OF DIGITALIS

Elsewhere in this issue (Correspondence, p. 2093) appears a communication from the chairman of the Subcommittee on Biological Assays of the United States Pharmacopeia calling attention to the changes in strength and in method of assay of the digitalis preparations of the next revision of the United States Pharmacopeia. Important to the physician is recognition of these changes and understanding of their significance.

Justification for standardization of medicines lies in the facilitation of the interchange of experience. In successive revisions of the United States Pharmacopeia in past decades certain potent drug preparations have been made to conform to international practice. In the revision now current, the eleventh, effective since June 1, 1936, the strengths of powdered digitalis and tincture of digitalis have been adjusted to conform to the standards of the League of Nations. Those responsible for this decision knew that an increase in the strength of digitalis in use in the United States would result. However, the information apparently did not reach the medical profession generally. Only when experience began to reveal the change did it get the proper publicity. Unfortunately by this time there had developed a controversy over what is to some extent a secondary matter. How much had the strength been increased? The chairman of the Subcommittee on Biological Assays of the Eleventh Revision firmly believed that the increase was about 30 per cent.¹ Others have

1. Edmunds, C. W.: The Potency of Digitalis Preparations of the 1936 Pharmacopeia, *J. A. M. A.* 113: 284 (July 22) 1939.

differed with him, holding that the increase was greater, up to 50 per cent or more.²

Criticisms do not seem to have been offered of the intent of the Revision Committee of the U. S. P. XI to make the digitalis preparations of the U. S. P. conform to international practice. As far as it failed to do exactly what was intended this failure was for technical reasons, centering in part at least around the particular material used as the standard of reference. The Twelfth Revision committee has wisely continued the general policy. Again a reference digitalis powder has been established against which all official digitalis preparations are to be assayed. Although it is this powder that is the legal standard, it has been adjusted to contain the same number of international units per gram as it does U. S. P. XII units. Therefore the tincture of digitalis U. S. P. XII will be of the same potency, for example, as the tincture of digitalis of the British pharmacopeia. This action means that official digitalis preparations will continue to be more potent than those in use during the period prior to 1936.

The U. S. P. XII revision committee has not only adopted a new standard reference powder in place of the old but also has adopted a new method of comparison of digitalis preparations with the official standard. Cats are now to be used for purposes of comparison rather than frogs. Although the communication from the chairman of the Subcommittee on Biological Assays does not discuss the reasons for this change in method it represents apparently recognition of the claims of Gold, Cattell and their associates³ that assays made on cats give results which more nearly parallel the potency in man than those which use frogs. Change from frogs to cats does not, however, involve acceptance of the cat unit. Indeed, the studies of the Cornell group⁴ have shown that it may require 25 cat units of digitalis leaf to digitalize a subject, whereas 3 cat units of "digitaline native" will accomplish the same end. Such studies, of course, have destroyed the value of the "cat unit" as a guide to dosage.

With adoption of both a new reference standard and a new method of assay, confidence of the medical profes-

sion in the uniform potency of official preparations should be increased. However, the communication from the chairman of the Subcommittee on Biological Assays properly emphasizes that confusion will continue unless the profession clearly recognizes that there has been an increase in potency of about 25 per cent over preparations in use prior to 1936.

AIR RAID HYPOIMMUNITY

Hygienists will find material for thought in Pfannenstiel's¹ recent report of the effect of wartime conditions on the general level of immunity among people of western Europe. For a decade Pfannenstiel and his co-workers have studied the variation in the bacteriostatic and bactericidal power of the blood of animals under variable nutritional and environmental conditions.

While they did not assume that variations in serum titer are complete measures of changes of immunity in experimental animals, they did assume that humoral variations are the best available indexes in such studies. The technic adopted for such studies was a modification of the technic endorsed by Wright and Holsen,² a constant volume of defibrinated blood mixed with an arbitrary volume of bacterial suspension. The

mixture is incubated for twenty-four hours with a control utilizing the same bacterial suspension in melted agar. Comparison of the number of colonies which develop in the two tests gives a ratio which they designated as the "bactericidal index." Thus if 1,000 colonies per unit volume develop in the control agar mixture, while but 200 viable organisms are demonstrable in the incubated blood sample, the "index" (or ratio) is 1,000:200, or 5. An index of 1 thus means a complete absence of bactericidal action. Applying this technic, Pfannenstiel found that the bactericidal index of a rabbit's blood, for example, is often raised thirtyfold (average, from 2.2 to 56.7) within four hours after intravenous injection of neoarsphenamine, with an occasional rabbit showing an increase of as much as one hundred and fifty fold.³

A Call To Service

DR. FRANK H. LAHEY

President of the American Medical Association

The establishment by the government of a Procurement and Assignment Agency properly places the responsibility for obtaining medical personnel in the hands of the medical profession. The success of this agency depends entirely on a few basic features: the complete cooperation of medicine in what even the most doubting must now admit is a truly national emergency; an unqualified willingness to serve the country however, wherever and whenever required; and a firm purpose to establish the fact that medicine intends to maintain its place in the forefront as it always has when a patriotic example is of such significance.

2. Bland, E. F. and White, Paul D.: The Strength of Digitalis in Clinical Use: A Warning. *J. A. M. A.* 117:1243 (Oct. 11) 1941.

3. Gold, Harry; Cattell, McKen; Kwit, N. T., and Kramer, Morton: *J. Pharmacol. & Exper. Therap.* 73:212 (Oct.) 1941.

4. Gold, Harry; Kwit, N. T., and Cattell, McKen: *J. Pharmacol. & Exper. Therap.* 69:177 (July) 1940.

1. Pfannenstiel, W., and Dötzer, W.: *Ztschr. f. Immunitätsforsch. u. exper. Therap.* 99:86 (Dec. 4) 1940.

2. Holsen, T.: *Ztschr. f. Vitaminforsch.* 1:3, 1932.

3. Pfannenstiel, W., and Quante, W.: *Ztschr. f. Immunitätsforsch. u. exper. Therap.* 88:1 (May 30) 1936.

In his earlier studies Pfannenstiel used the typhoid bacillus as his test micro-organism.⁴ He found, for example, that a diet of turnips increases the bactericidal titer of rabbits and that three days' inanition had an even more beneficial effect. The latter observation is contrary to previous data reported by Meltzer and Norris,⁵ who found that the bactericidal action of dog serum was static, "no matter whether it was taken from a well fed, overfed or starving animal." Their studies agree, however, in denying a reduction in humoral immunity as a result of moderate starvation. Pfannenstiel afterward tested the effect of quantitative variations in the daily intake of individual food elements. He found, for example, that a moderate decrease in the daily intake of a mixture of the four vitamins A, B, C and D was without deleterious effects. Subnormal blood titers produced by any cause, however, were increased to normal by the administration of relatively large doses of vitamin C. He concluded from these vitamin tests that in rabbits the bactericidal titer and the vitamin C content of the blood stream are interdependent variables, i. e. they vary parallel with each other.

The immunologic effects of low nutritional level and low vitamin intake became of major importance with the outbreak of the present European war. Bimonthly titrations of bactericidal power and vitamin C content of human blood were therefore begun early in 1940 in the Hygienic Institute, Marburg, Germany. During the first six months the vitamin C content of the blood of selected hospital personnel varied from 2.54 to 14.4 mg. per hundred cubic centimeters. The bactericidal titers of the same individuals varied from 1.00 to 5.04, staphylococci being used as the test micro-organisms. The most obvious fact was the complete lack of parallelism between the vitamin C content and the bactericidal index. The highest recorded bactericidal titer (5.04) was associated with a relatively low vitamin content (5.24 mg.), while the highest vitamin titer (11.46 mg.) was accompanied by low humoral immunity (1.36). The conclusion drawn from these data is that the bactericidal power and the vitamin C content of human blood are independent variables. Partial vitamin C starvation, therefore, has not apparently had deleterious effects on immunity among persons in central Europe. A low total food intake may even be beneficial in conquered countries, since in rabbits from three to five days' total inanition increases the resistance to microbes.

In order to explain observed fluctuations in individual resistance to bacteria, Pfannenstiel called attention to the repeated nocturnal air raid alarms during July and August, with the resulting overwork and loss of sleep. Following each sleepless night half of the selected hospital personnel showed a lowering of bac-

tericidal titer. In 1 case the previous index (5.04) fell two thirds (i. e. to 1.53) following a nocturnal air raid alarm. In a second person there was a complete loss of previous bactericidal power. It may or may not be a coincidence that the second person developed a staphylococcal infection during August, the period of air raid alarm hypoinnunity. Insomniac depression of bactericidal titer was not noted in those who had an opportunity to sleep during the daytime following the night raid.

Disregarding the evident propaganda motivation of this research, evidence of the lack of parallelism between vitamin C intake and bactericidal immunity (or the relatively small amount of vitamin C necessary to maintain maximum humoral efficiency) is of basic clinical interest. Evidence of an insomniac depression of natural immunity is a belated confirmation of a belief long held by physicians. Whether or not data drawn from selected hospital personnel are applicable also to the regional population was not tested by the Nazi investigators.

Current Comment

COLOSTRUM CUTANEOUS TEST FOR PREGNANCY

Several tests have been proposed for furnishing an early reliable diagnosis of pregnancy. An immunologic test, depending on a local cutaneous reaction, has been especially sought. However, thus far only biologic tests are considered reliable. Recently Falls, Freda and Cohen¹ reported a method of cutaneous testing which is claimed to be 98 per cent accurate in pregnant women and 96 per cent accurate in nonpregnant women. In this test a preparation of colostrum is injected into the skin. A faint reaction or none at all is apparent in pregnant women, while the nonpregnant react with a prominent wheal typical of an allergic response. This reaction appears within one-half hour, according to the authors. They tested 358 known nonpregnant women and 265 pregnant women at the time of their report. The test has already been commercialized by G. H. Sherman, M.D., Inc., and physicians are being circularized with the statement that the test is accurate and dependable in the hands of any physician. In view of lack of evidence supporting the results of the original investigators, this premature exploitation is deplored. Physicians may well maintain a skeptical attitude toward the promoter's advertising claims until the original work of Falls and his associates has been adequately confirmed. In this regard complications seem to have developed, as Weisman and Snyder report, in the October issue of the *American Journal of Obstetrics and Gynecology*, page 738, a wide margin of error in the diagnosis of pregnancy by the use of this test. The well established biologic tests need not yet be abandoned.

1. Falls, F. H., Freda, V. C., and Cohen, H. H.: A Skin Test for the Diagnosis of Pregnancy, *Am. J. Obst. & Gynec.* 41: 431 (March) 1941; read before the fifty third annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Excelsior Springs, Mo., Sept. 26, 1940.

4. Pfannenstiel, W.: *Ztschr. f. Immunitätsforsch. u. exper. Therap.* 56: 389 1927.
5. Meltzer, S. J., and Norris, C.: *J. Exper. Med.* 4: 131, 1899.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE

Office of Civilian Defense Needs Two Physicians Immediately

The United States Public Health Service requires at once two physicians, aged 45 to 60, for important duties in connection with the Office of Civilian Defense. If found suitable, these physicians will be offered commissions in the Reserve Corps of the United States Public Health Service in the grade of Senior Surgeons with pay and allowances of the grade corresponding to that of Lieutenant Colonel in the Army or Commander in the Navy. As soon as commissioned, they will be ordered to active duty and directed to report to the Chief Medical Officer of the Office of Civilian Defense. Duties in general are to represent the Medical Division of the Office of Civilian Defense in the Sixth and Seventh Defense regions (this corresponds to the Sixth and Seventh Army Corps areas), study the Office of Civilian Defense program, interpret the medical program to the state and local defense organizations, maintain contact with state and local defense organizations, establish and maintain liaison with governmental and other medical and health organizations in that area, also liaison with the district public health service offices and inspect emergency medical field units in local civilian defense organizations. Active duty will be for the duration of the emergency. Applications should be sent directly to the Executive Officer, Procurement and Assignment Service, New Social Security Building, room 5654-ODH, Fourth and C streets, Washington, D. C.

FORTY-TWO MORE NEW NAVY MEDICAL OFFICERS

The U. S. Navy Department, Washington, D. C., has announced the appointments of the following forty-two physicians as assistant surgeons in the medical corps of the navy to rank as lieutenants (junior grade):

ANDERSON, D. F., Mount Vernon, Ill.	JOHNSON, Frank G., Omaha.
BAKER, W. S., Jr., Detroit.	KULCZYCKI, Edward, Scranton, Pa.
BELL, John P., Annapolis, Md.	LAWRENCE, Richard, Jr., San Francisco.
BURT, Charles W., Detroit.	LEIGHTON, Herbert T., Boston.
CAREY, John E., Kenmore, N. Y.	LOWMAN, E. W., San Diego, Calif.
CLEMENT, Conrad C., Babylon, N. Y.	LYONS, Harold A., Brooklyn.
DASLER, Theodore W., Deer Park, Wis.	MACKBY, Maxwell J., New York.
DAY, Lawrence C., Grayslake, Ill.	MANN, B. F., Jr., Hartford, Conn.
deTARNOWSKY, G. O., Bartlett, Ill.	MILLS, Dawson A., Pittsburgh.
DOUGHERTY, William J., Washington, D. C.	MOORE, Jack D., Montclair, N. J.
DUNN, John C., Brooklyn.	MURPHY, John M., Portsmouth, Va.
EISBERG, Harry B., Staten Island, N. Y.	NIFOROPULOS, J. A., Schenectady, N. Y.
ENGLE, Paul R., Petoskey, Mich.	ORR, Robert B., Brooklyn.
FALK, Victor S., Wauwatosa, Wis.	RICKERD, Charles L., Seattle.
FRANTZ, Winthrop S., Sacramento, Calif.	SHAFIROFF, Charles, Jamaica, Ind.
GARNETT, R. W., Jr., Emory University, Ga.	SPAULDING, E. M., New Albany, Ind.
GULLEDGE, W. H., Wadesboro, N. C.	STUCK, Jaul L., Jonesboro, Ark.
HUNTER, William L., Emory University, Ga.	UMIKER, William O., Buffalo.
JACOBY, Jack M., Detroit.	WHITE, W. A., Jr., Pearl Harbor, Hawaii.
JARDON, F. J., Philadelphia.	WHITELY, Ralph D., Washington, D. C.
JARRETT, Thirl E., Norfolk, Va.	WOOD, Norman L., New York.

TYPHOID VACCINE OUTPUT INCREASED 800 PER CENT

Typhoid-paratyphoid vaccine is made at the Army Medical School in the largest laboratory of its kind in the world. The planting and harvesting rooms, made of monel metal and glass, are sterilized with live steam. During the various steps of vaccine making the chambers are sealed, and conditioned air sterilized by washing and passing through ultraviolet light is pumped in under positive pressure. All the typhoid-paratyphoid vaccine required for use by the Army, the Navy, the Civilian Conservation Corps and other federal departments is made at this laboratory, which at peak production can provide one and a half million doses of the vaccine every week. During the last fiscal year the output was increased over 800 per cent.

PLAN TO RELIEVE SHORTAGE OF NURSES

To relieve the shortage of nurses in hospitals, clinics, public health and field nursing agencies, the American National Red Cross and the Office of Civilian Defense, Washington, D. C., have jointly undertaken a project to train 100,000 volunteer nurses aides, with whose assistance graduate nurses may extend their services to many more patients. The volunteer aide will work under the supervision of a nurse in performing certain nontechnical tasks in order that graduate nurses may be released for highly technical duties.

The local office of Civilian Defense and the local chief of Emergency Medical Service in communities where the program for training nurses aides is undertaken will assist the Red Cross and the Civilian Defense Volunteer Office in enrolling desirable applicants for training as nurses aides and will assist local chapters to make arrangements with general hospitals to serve as training centers. The first half of the course of instruction, consisting of lectures and demonstrations, will be given in the Red Cross Chapter Hospital or other suitable place, while the second half of the course will be given in a hospital selected by the Red Cross and the Office of Civilian Defense as a training center.

The Red Cross has outlined in its publication "Chapter Organization and Administration of Red Cross Volunteer Nurses Aides Corps" the duties of nurses aides which will be subject to the approval of individual institutions. Among other activities, the nurses aides in the hospitals may take care of personal belongings of patients, make beds, feed helpless patients, clean dressing trays, take patients to and from treatment rooms, help with the admission and discharge of patients, care for ambulatory patients, take care of linen closets and of rubber goods, and in dispensaries and clinics may serve as interpreters in foreign languages, dress and undress children, clean and put away instruments, help weigh and measure, assist in taking physicians' notes and help with inventories.

The Office of Civilian Defense, Washington, D. C., has prepared a syllabus of the courses to be given nurses aides, and the American Red Cross has published a Guide for the Training of Volunteer Nurses' Aides, and copies of these are available from local Red Cross chapters or from Regional Civilian Defense Offices.

Nurses aides are to serve without remuneration. The time for the course of instruction is eighty hours. After the first thirty-four hours of the course the aides will wear the uniform with insignia, described in the Guide for the Training of Volunteer Nurses' Aides. Membership in the Nurses Aides Corps requires the aide to be between 18 and 50 years of age when

enrolled, in satisfactory physical condition, a graduate from high school or equivalent. One hundred and fifty hours of service must be given in each calendar year, preferably in a three months period, and the first one hundred and fifty hours must be spent in hospital wards before assignments to clinics and field nurses' organizations. In time of war or other national emergency, aides must be prepared to serve whenever and for as long a period as needed.

BALANCED MEALS FOR SOLDIERS

A master menu, containing all the necessary nutritional requirements for an active soldier and ample variety and quantity of foods, is under preparation by the Army Quartermaster Corps. It will be divided into twelve units, one for each month, containing submenus for every day in the week. The November series was sent out to all Corps Area Commanders. The menus can be used as prepared or adapted to local needs. On the basis of the master menu, monthly menus will be prepared for use in Army posts, camps and cantonments.

The master menu is prepared with the average soldier in mind. He is of medium height and weight but, being engaged in strenuous activities, is hungrier than the average civilian of the same build. The average number of calories daily per man is about 4,500. The menus call for more minerals than meet the requirements of the Nutritional Committee of the National Research Council: iron in excess of 20 mg., phosphorus 2.2 Gm. and calcium 1.1 Gm. The vitamin A total daily is about 7,000 international units, vitamin C 115 mg., vitamin B₁ (thiamine hydrochloride) 3 mg. and vitamin B₂ (riboflavin) 3.1 mg.

Care is exercised to insure that the soldier shall not get a surplus of starchy foods at any one meal. Peas, for example, are not served with corn or beans, nor potatoes with macaroni or spaghetti. Where canned fruits and vegetables are listed in the menus, fresh fruit and vegetables should be substituted if they are available, according to the locality. The following is a typical menu from the master menu for a November day:

Breakfast	Dinner	Supper
Orange	Barley soup	Spareribs
Assorted cereal	Soft roast beef	Boiled potatoes
Fresh milk	Creamed potatoes	Buttered cabbage
Cheese omelet	Spinach	Cinnamon buns
Lyonnais potatoes	Pickled beet salad	Bread and butter
Bread and butter	Bread and butter	Coffee
Coffee	Coffee	

REGIONAL MEDICAL OFFICERS FOR CIVILIAN DEFENSE

The Office of Civilian Defense, Washington, D. C., has organized on a regional basis, with regions corresponding to the U. S. Army Corps Areas. A regional director has been appointed for each region with headquarters in the same city in which the corps area headquarters are located. Regional medical officers have been appointed as follows:

First Civilian Defense Region: Dr. Allan M. Butler, 101 Milk Street, Boston.

Second: Dr. H. Van Zile Hyde, 111 Eighth Avenue, New York.

Third: Dr. W. Ross Cameron, 400 Cathedral Street, Baltimore.

Fifth: Dr. William S. Keller, 425 Cleveland Avenue, Columbus, Ohio.

Eighth: Dr. Witten B. Russ, Room 1014, Majestic Building, San Antonio, Texas.

Ninth: Dr. Wallace Hunt, 233 Sansome Street, San Francisco.

These physicians have been commissioned as senior surgeons in the U. S. Public Health Service.

HISTORY OF EXPANSION OF MEDICAL ACTIVITIES DURING THE PRES- ENT EMERGENCY

A history of the expansion of medical activities in the United States during the present emergency is now being compiled under the direction of Dr. John F. Fulton, chairman of the subcommittee on historical records of the Committee on Information, Division of Medical Sciences of the National Research Council. The history will analyze the expanded activities of the civilian and governmental medical agencies from April 1939, when defense expansion began, until the end of the emergency.

According to the *Army and Navy Journal*, November 22, the general history of medical activities during the emergency will be contained in nine volumes, a number subject to change.

Major Gen. James C. Magee, Surgeon General of the Army, has stated that special emphasis will be placed on the history of the Medical Department divisions since April 1939, when an authorized increase in the Air Corps and the forces at Panama signaled the beginning of defense expansion. General Magee has requested Col. Albert G. Love, M. C., retired, to return to active duty to supervise the present medical department history. Colonel Love is organizing the history of the Medical Department since April 1939, which tentatively will be contained in seven volumes, supplementing the nine general volumes.

Colonel Love, who is said to be an authority on analytic histories of the Medical Department, and Capt. Lewis H. Roddis, M. C., U. S. Navy, are co-editors of volume VI of the general nine volume history, which will contain the "Medical History of Individual Operations and Engagements." Col. George R. Callender, M. C., is editor of volume II, which will give the history of "Offensive Weapons in Relation to Injury." The only other histories of Medical Department activities are those which are concerned with the Civil War and World War I. The present history, when completed, will make the third analytic work completed and the first to contain an analysis of all medical activities—civilian, military and governmental.

PROTECTIVE PROCEDURES FOR HOSPITALS

Dr. George Baehr, chief medical officer of the Office of Civilian Defense, Washington, D. C., has appointed the following subcommittee of the Advisory Board of the Medical Division, Office of Civilian Defense, to prepare recommendations on protective procedures for hospitals in the event of belligerent action:

Dr. Robin C. Buerki, director of hospitals of the University of Pennsylvania, Philadelphia, chairman.

Dr. Willard C. Rappleye, commissioner of hospitals, New York.

Dr. Asahel J. Hockett, superintendent of Touro Infirmary, New Orleans.

Dr. Anthony J. J. Rourke, medical superintendent of Stanford University Hospitals, San Francisco.

Dr. Joseph Turner, director of Mount Sinai Hospital, New York.

Dr. Huntington Williams, commissioner of health of Baltimore.

The subcommittee held its first meeting in New York on November 8. With Dr. James M. Mackintosh, former chief medical officer of the Scottish Ministry of Health, as a guest to advise the group, measures for preventing or minimizing damage to buildings, handling of casualties, evacuation, provision and protection of supplies, and training of personnel for specific duties in case of bombing were discussed. The basis for discussion was a study made by a committee of the American Hospital Association on physical defense of hospitals. It is expected that a report will be issued jointly by the hospital association committee and the committee representing the Office of Civilian Defense.

The basic organization for rescue work in a given area consists of three essential groups with a central control, police, rescue and fire services, air raid precaution control and medical service.

HUGE REFRIGERATORS FOR ARMY FOOD SUPPLIES

Some of the mammoth army ice boxes will hold enough perishable food—meat, butter, eggs, fruit and vegetables—to feed a division of about fifteen thousand soldiers for two weeks. Recently a quartermaster statistician observed in one of these ice boxes 50 tons of meat, 6 tons of butter, 8,000 dozen eggs and, among other items, 25 tons of fresh fruits and vegetables.

HEALTH EDUCATION CONSULTANTS TO BE ASSIGNED TO DEFENSE AREAS

The rapid growth in industrial and governmental production has caused unusual concentrations of population and increasing health problems. To assist state, county and local health officials in coping with these problems, the U. S. Public Health Service is planning to appoint health education consultants to various defense areas. The positions, paying \$2,600 to \$3,899 a year, will be filled through the open competitive examination process and the Federal Civil Service Commission has just issued the

examination announcement. A written test will not be given, but applicants will be rated on their qualifications as shown in their applications and corroborative evidence.

Appointees will work with local health officers and their staffs, advising them as to methods and procedures of health education, such as individual instruction through interview, group instruction through discussions, talks, lectures and other educational technics. To qualify for the positions, applicants must have completed a four year college course, including or supplemented by special study—or, for the assistant grade, experience—in public health. In addition they must have had experience in

public health education work coordinating the activities of all organized health groups in a community for the purpose of promoting a public health program. This experience must have been in a federal, state or official local public health department or in a voluntary agency such as the Red Cross or the Tuberculosis Association.

Applications must be filed with the Civil Service Commission in Washington, D. C., not later than December 11. The examination announcement giving detailed requirements can be obtained at any first or second class post office or at the central office in Washington, D. C.

ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ARGO, William Lind, 1st Lieut., Oakland, Calif.
BULLINGTON, Bert Montell, 1st Lieut., Ann Arbor, Mich.
FULTZ, George Simeon, Jr., 1st Lieut., Butterworth, Va.
REICHEL, John, Jr., 1st Lieut., Wynnewood, Pa.
ROSEN, Victor Hugo, 1st Lieut., Baltimore
SIEBECKER, Karl LaFollette, 1st Lieut., Los Angeles.

THOMPSON, Robert Philp, 1st Lieut., San Francisco.
WALKER, Douglass Willey, 1st Lieut., New Haven, Conn.
WEINSTEIN, Harry, 1st Lieut., Chowchilla, Calif.
WILLERS, Carl Elmer, 1st Lieut., San Francisco.

Orders Revoked

BERMAN, Lawrence, 1st Lieut., Detroit.
JOHNSON, Carroll Allen, Jr., 1st Lieut., Healdton, Okla.
MICKEL, Arthur A., 1st Lieut., Benicia, Calif.
RYAN, Bernard F., 1st Lieut., Ahwahnee, Calif.
SCHILDHAUS, Andrew I. E., 1st Lieut., Burlington, Vt.

CORRECTION

War Department.—The following names of medical reserve officers were erroneously published as "relieved from active duty" in THE JOURNAL, September 6, under the Ninth Corps Area. These names should have been published under "War Department" as "ordered to active duty": Major Albert Guernsey Clark, San Francisco, and Lieuts. Samuel S. Blankstein, Milwaukee; Irving Lawrence Greenberg, Atlanta, Ga.; John Joseph

Manning, Chicago; John Edward Naugle, Denver; Ernest Boris Newman, Brooklyn; Phosa David Nutter, Russellville, W. Va.; Samuel Sidney Platt, Chicago; Reno Russell Porter, Brookline, Mass.; Peter Albert Reiersen, Chicago; Owen Bernard Royce, Oklahoma City; Thomas Robert White, Redlands, Calif., and William Luther White, Philadelphia.

FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

CHAIT, Sidney A., 1st Lieut., Middletown, Conn., Fort Banks, Mass.
DEL CAMPO, Dante, 1st Lieut., Lynn, Mass., Westover Field, Mass.
CORRIGAN, Francis V., 1st Lieut., Providence, R. I., Windsor Locks, Conn.
CRISCUOLO, Joseph A., Jr., 1st Lieut., New Haven, Conn., Fort H. G. Wright, N. Y.
HARRIS, Oliver J., 1st Lieut., Boston, Westover Field, Mass.
LAMB, Francis D., 1st Lieut., West Warwick, R. I., Windsor Locks, Conn.

MORRISON, Jonathan I., 1st Lieut., Waban, Mass., Westover Field, Mass.
PATTERSON, John C., 1st Lieut., Boston, Manchester, N. H.
SIMON, Norman, 1st Lieut., Lawrence, Mass., Westover Field, Mass.
WALKER, Donald A., 1st Lieut., Worcester, Mass., Army Air Base, Bangor, Maine.
YAVAROW, Mully Millin, 1st Lieut., Everett, Mass., Manchester, N. H.

Orders Revoked

BRIER, Hyman D., 1st Lieut., Bridgeport, Conn.
DOERNER, Alexander A., 1st Lieut., Chelsea, Mass.
FELDERMAN, Jacob, 1st Lieut., Rutland Heights, Mass.
PEARSON, Grosvenor B., 1st Lieut., Foxboro, Mass.
SODA, William E., 1st Lieut., Bridgeport, Conn.

SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ANDERSON, Orrin E., 1st Lieut., Clifton Springs, N. Y., Fort Du Pont, Del.
BERGER, Harold R., 1st Lieut., Elizabeth, N. J., Fort Jay, N. Y.
BLUESTONE, Leon, 1st Lieut., Brooklyn, Camp Claiborne, La.
HELDMAN, Arthur, 1st Lieut., New York, Camp Shelby, Miss.
HOOD, George B., 1st Lieut., Camden, N. J., Fort Bragg, N. C.

LAPIDUS, Bernard, 1st Lieut., New York, Pine Camp, N. Y.
MARRELLA, Louis F., 1st Lieut., Jersey City, N. J., Camp David, N. C.
MOUNTAIN, Edward R., 1st Lieut., Olean, N. Y., Fort Ontario, N. Y.
PISANI, Antonio J., 1st Lieut., New York, Pine Camp, N. Y.
SMITH, Henry T., Major, New York, Camp Wheeler, Ga.
TURNER, Fennell P., 1st Lieut., New York, Camp Claiborne, La.
VON SALZEN, Charles F., 1st Lieut., Kings Park, L. I., N. Y., Camp Upton, N. Y.

Orders Revoked

VALENTE, Michael A., 1st Lieut., Fort Benning, Ga.

THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

DEAN, James Seay, Captain, Pennhurst, Pa., Fort Eustis, Va.
GRAU, John Karl, 1st Lieut., Beaver Falls, Pa., Fort George G. Meade, Md.
HAMPSEY, Joseph William, Captain, Pittsburgh, Camp Lee, Va.
HENDERSON, Charles Henry, Captain, Norton, Va., Fort Belvoir, Va.
MASLAND, Richard Lambert, 1st Lieut., Philadelphia, Fort George G. Meade, Md.

MICELI, Joseph, 1st Lieut., Baltimore, Fort Belvoir, Va.
OPPLEMAN, Herman Frank, 1st Lieut., Richmond, Va., MacDill Field, Fla.
PROCOPPIO, James Joseph, 1st Lieut., Shamokin, Pa., Camp Claiborne, La.
RALSTON, Edgar Lee, 1st Lieut., Murrys ville, Pa., Fort George G. Meade, Md.
RANDALL, Robert Stewart, 1st Lieut., Washington, D. C., Fort Dix, N. J.
SAMPLE, Hyde Glenn, Jr., 1st Lieut., Pittsburgh, Edgewood Arsenal, Md.
SCHORNICK, James Curtis, 1st Lieut., Philadelphia, Fort George G. Meade, Md.
SETTLE, William Booth, Captain, Baltimore, Indiantown Gap Military Reservation, Pa.

SINDACO, Mario Secondo, 1st Lieut, Plains, Pa, Indiantown Gap Military Reservation, Pa
SPIEGEL, Herbert X, 1st Lieut, Washington, D C, Fort George G Meade, Md

Orders Revoked

BAILEY, Charles P, 1st Lieut, Philadelphia
BARNETT, Luke J, 1st Lieut, Pittsburgh
BASTIEN, Henry L, Captain, Arlington, Va
CAMPELL, Hawes, Jr, 1st Lieut, Gary, W. Va
CHESNUT, John L, 1st Lieut, Mountain Grove, Va
COOPER, George, Jr, 1st Lieut, Charlottesville, Va
COVALESKY, Victor J, 1st Lieut, Aspinwall, Pa
CRAVOTTA, Charles A, Captain, Pittsburgh
ERHARD, Gerald A, 1st Lieut, Curwensville, Pa
FRONCZEK, William M, 1st Lieut, Pittsburgh
GATES, Earle C, Captain, Chesterfield, Va
HURST, John W, 1st Lieut, Altoona, Pa
ITSCOTTZ, Seymour E, 1st Lieut, McKeesport, Pa

KAUFMAN, Benjamin V, 1st Lieut, Taylor, Pa
LIN, John P, Captain, Stroudsburg, Pa
LYON, William C, 1st Lieut, Ardmore, Pa
MENSCH, Maurice, 1st Lieut, Washington, D C
MESSER, William A, Captain, Pittsburgh
MITCHELL, John A, 1st Lieut, Monaca, Pa
PUGH, George E, 1st Lieut, Scranton, Pa
RATTENNE, Edward, 1st Lieut, Elkton, Va
RUEHL, William W, 1st Lieut, Pittsburgh
SCHEIN, Robert A, 1st Lieut, Pittsburgh
SCHWARTZMAN, Joel J, 1st Lieut, Oaklyn, N J
SHENKIN, Henry A, 1st Lieut, Philadelphia
SNOW, Lee B, 1st Lieut, Washington, D C
THOMAS, Preston W, 1st Lieut, Mayview, Pa
VORBRINCK, Thomas M, Captain, Norfolk, Va
WALMER, Charles R, 1st Lieut, Pittsburgh
WILCOX, Homer B, Jr, 1st Lieut, Kingston, Pa
WILSON, John M, Jr, 1st Lieut, Pittsburgh
WITKIN, Leon A, 1st Lieut, Philadelphia

FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana

BOLGLA, Julius Hill, 1st Lieut, Spartanburg, S C, Fort Barrancas, Fla
COHEN, Nace Ralph, 1st Lieut, Montgomery, Ala, Camp Gordon, Ga

DeFREESE, Samuel J, 1st Lieut, Atlanta, Ga, Fort Barrancas, Fla
DITATA, Domenick, Captain, Montgomery, Ala, Fort Barrancas, Fla
GAILLARD, Peter C, Jr, 1st Lieut, Beaufort, S C, Fort McClellan, Ala
ROZIER, John S, 1st Lieut, Leesville, La, Camp Forrest, Tenn
SMITH, Charles G, III, 1st Lieut, Rocky Mount, N C, Fort Barrancas, Fla

Orders Revoked

EVERS, Herbert Ray, 1st Lieut, Andalusia, Ala
MOLE, John William, Captain, Brunson, S C
ROSS, Sam H, 1st Lieut, Seneca, S C
SAMPOGNARO, Vincent J, 1st Lieut, Monroe, La

FIFTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Fifth Corps Area, which comprises the states of Ohio, West Virginia, Indiana and Kentucky:

ABRAHAMSON, Ira Arthur, Lieut Colonel, Cincinnati, Camp Davis, N C
ADELMAN, Jack Arnold, 1st Lieut, Columbus Ohio, Drew Field, Fla
ADLER, Raymond Nicholas, 1st Lieut, Evansville, Ind, Fort McClellan, Ala
AKE, Loren Francis, 1st Lieut, Cambridge City, Ind, Camp Polk, La
ALBERTSON, Frank P, 1st Lieut, Tralfalgar, Ind, Camp Shelby, Miss
ALEXANDER, Eugene James, 1st Lieut, Evansville, Ind, Camp Polk, La
ARIHUR, Robert Daniel, Captain, Springfield, Ohio, Camp Davis, N C
ASH, Edwin Everett, 1st Lieut, Forest, Ohio, Luke Field, Ariz
AVERY, Bruce Franklin, 1st Lieut, Whiting, Ind, Camp Grant, Ill
BAKER, Leslie Mayer, 1st Lieut, Aurora, Ind, Fort Oglethorpe, Ga
BARKER, Harold Jerome, 1st Lieut, Cleveland Heights, Ohio, Camp Shelby, Miss
BARNARD, William Harvey, Captain, Elizabethtown, Ky, Camp Wheeler, Ga
BELINKY, Nathan Donald, 1st Lieut, Youngstown, Ohio, Fort Santiago, Philippine Islands
BENEDETTO, Eugene Rudolf, 1st Lieut, Alliance, Ohio, Fort Bragg, N C
BEVNETT, Jene Richard, 1st Lieut, Plymouth, Ind, Air Base, Lowry Field, Colo
BEREN, Irvin Bernard, 1st Lieut, Cincinnati, Fort Bragg, N C
BERGER, Irving Lester, 1st Lieut, Cleveland Heights, Ohio, Fort Jackson, S C
BERGER, Pears Benn, Captain, Englewood, Ohio, Camp Shelby, Miss
BERSHADSKY, Solomon, 1st Lieut, Cincinnati, Air Base, Gunter Field, Ala
BERTLING, Marion Henry, 1st Lieut, McComas, W Va, Fort Bragg, N C
BINZER, Isadore Irving, 1st Lieut, Toledo Ohio, Fort Knox, Ky
BOICE, Robert Roland, Captain, Pomeroy, Ohio, Camp Blanding, Fla
BORER, Raymond John, Captain, Toledo Ohio, Fort Jackson, S C
BOSWORTH, Nathaniel Lewis Jr, 1st Lieut, Lexington, Ky, Fort Knox, Ky
BOWERS, Copeland Conneily, Captain, Kokomo, Ind, Sheppard Field, Texas
BOWERS, Garvey Bruce, Captain, Kimball, W Va, Losey Field Puerto Rico
BRADFORD, Bert, Jr, 1st Lieut, Charleston, W Va, Camp Forrest, Tenn
BRAMMER, Fred Emerson Major, Huntington W Va, Camp Wheeler, Ga
BREMEN, Harry A, 1st Lieut, Dayton, Ohio, Ellington Field, Texas
BROOKIE, Roger William, Major, Florida Ind, Camp Croft, S C
BROWN, Robert Henry, 1st Lieut, Cincinnati, Camp Livingston, La
BRUMBALGH, Joseph John, Major, Canton, Ohio, Station Hospital San Juan, Puerto Rico

BRUNLEY, Donald Richard, Captain, Tiffin, Ohio, Columbus General Depot, Columbus, Ohio
BUNIN, Simon S, 1st Lieut, Cleveland, Camp Shelby, Miss
BURGIN, Bernard, 1st Lieut, Cincinnati, Camp Shelby, Miss
BURNIKEL, Raymond Henry, 1st Lieut, Evansville, Ind, Lowry Field, Colo
BUSH, Joe Milbert, Captain, Mount Sterling, Ky, Fort Benning, Ga
BUTTE, Clarence Ivanhoe, Jr, 1st Lieut, Matoaka, W. Va, Camp Claiborne, La
CAFARO, Secondo Raymond, 1st Lieut, Youngstown, Ohio, Camp Blanding, Fla
CALO, Frank James, 1st Lieut, Cleveland, Camp Shelby, Miss
CAMPBELL, George Warren, 1st Lieut, Columbus, Ohio, Camp Davis, N C
CAMPBELL, Leland Eston, 1st Lieut, Cleveland, Ellington Field, Texas
CAMPION, Woodrow Marcellus, 1st Lieut, Cleveland, Fort Bragg, N C
CARNEY, Wilfred Ignatius, 1st Lieut, Youngstown, Ohio, Camp Wheeler, Ga
CHATTIN, Herbert Odell, 1st Lieut, Vincennes, Ind, Brookley Field, Ala
CLOUSE, Paul Alexander, 1st Lieut, Evansville, Ind, Kelly Field, Texas
COHEN, Arthur Robert, 1st Lieut, Springfield, Ohio, 2d Army Depot, Gordon, Ark
COHEN, Benjamin Bruns, 1st Lieut, East Chicago, Ind, Fort Jackson, S C
COHEN, Morris, 1st Lieut, Louisville, Ky, Camp Polk, La
COLLINS, James Robert, 1st Lieut, Xenia, Ohio, Fort Bragg, N C
COOK, Robert Gibson, 1st Lieut, Toledo, Ohio, Camp Forrest, Tenn
CRANK, Gilbert O, Major, Lawton, W Va, Camp Davis, N C
CREAMER, David Myers, 1st Lieut, Bellaire, Ohio, Fort Jackson, S C
DAVIS, Alexander Nick, 1st Lieut, Dayton, Ohio, Camp Shelby, Miss
DAVIS, William, 1st Lieut, Crestline, Ohio, Fort Dix, N J
DeARMOND, Albert Murray, Major, Indianapolis, Carlisle Barracks, Pa
DOAK, Alfred Deaderick, 1st Lieut, Shelbyville, Ky, Randolph Field, Texas
DOBKIN, Arthur, Captain, Akron, Ohio, Borinquen Field, Puerto Rico
DOUGHERTY, John Edwin, 1st Lieut, Canton, Ohio, Randolph Field, Texas
DUTROW, Howard Victor, Major, Dayton, Ohio, Borinquen Field, Puerto Rico
EBERLE, William Harrison, 1st Lieut, Ashtabula, Ohio, Fort Jackson, S C
EDEL, Charles Henry, Major, Ashtabula, Ohio, Borinquen Field, Puerto Rico
EDELSTEIN, Joseph Bernard, Captain, Toledo, Ohio, Camp Shelby, Miss
EGOLF, Charles Foster, Jr, 1st Lieut, Cincinnati, Fort Bragg, N C
EPSTEIN, Samuel, 1st Lieut, Struthers, Ohio, Fort Jackson, S C
FARGO, Warren Conrad, Lieut Colonel, Cleveland, Fort Sam Houston, Texas
FASOLDT, Laurence Otto, 1st Lieut, Glendale, Ohio, Randolph Field, Texas
FINK, Joseph John, Captain, University Heights, Ohio, Camp Shelby, Miss
FISH, John Spencer, 1st Lieut, Cleveland Heights, Ohio, Fort Bragg, N C

FLAX, Ellis, 1st Lieut., Cincinnati, Camp Shelby, Miss
FLEETWOOD, Raymond Anson, Captain, Nappanee, Ind., Camp Lee, Va
FLORA, Joseph Oren, 1st Lieut., Indianapolis, Fort Benjamin Harrison, Ind
FLORIDIS, Gregory George, 1st Lieut., Dayton, Ohio, Fort Bragg, N. C
FORWARD, Donald De Klyn, 1st Lieut., Ashtabula, Ohio, Camp Shelby, Miss
FRANCIS, Carl C., 1st Lieut., Cleveland, Camp Forrest, Tenn
FREDERICK, Victor Ray, 1st Lieut., South Charleston, Ohio, Camp Davis, N. C
GAILLARD, Ernest, Jr., 1st Lieut., Louisville, Ky., Randolph Field, Texas
GARRED, Emery William, 1st Lieut., Louisville, Ky., Fort McClellan, Ala
GATES, Edmund Oliver, Captain, Welch, W. Va., Camp Blanding, Fla
GIBER, Philip Bernard, 1st Lieut., Girard, Ohio, Camp Davis, N. C
GINN, Guy Augustus, Captain, Springfield, Ohio, Fort Bragg, N. C
GLACKMAN, John Clay, Lieut. Colonel, Rockport, Ind., Fitzsimons General Hospital, Denver
GLIER, James Randall, 1st Lieut., Greenheld, Ohio, Camp Shelby, Miss
GOLDBERG, Samuel David, 1st Lieut., Youngstown, Ohio, Camp Davis, N. C
GOLDSTEIN, Joseph Leon, 1st Lieut., Louisville, Ky., Fort Benning, Ga
GOLZ, Harold Habrich, 1st Lieut., Clarksburg, W. Va., Fort Oglethorpe, Ga
GOODMAN, Hubert Thorman, 1st Lieut., Terre Haute, Ind., Fort Oglethorpe, Ga
GOODMAN, Lawrence Hyuse, Captain, Findlay, Ohio, Fort Jackson, S. C
GOULD, Joseph Irwin, 1st Lieut., Toledo, Ohio, Fort Jackson, S. C
GRAY, James Howard, Captain, Clendenin, W. Va., Camp Davis, N. C
GREENBERG, Marcel, 1st Lieut., Cleveland, Fort Jackson, S. C
GREGG, Walter Kimpton, Captain, Dayton, Ohio, Camp Lee, Va
GRIFFIN, Robert James, 1st Lieut., Lexington, Ky., Fort McClellan, Ala
GRISSELL, Ted Lewis, 1st Lieut., Mitchell, Ind., Camp Shelby, Miss
GROSS, Theodore Anthony, 1st Lieut., Cleveland Fort Jackson, S. C
GROVE, Robert Houston, 1st Lieut., Scircleville, Ind., Camp Shelby, Miss
HAGGARD, Gordon Hill, Captain, Indianapolis, Fort Oglethorpe, Ga
HAMSHER, John Fremont, Major, St. Paris, Ohio, Camp Davis, N. C
HANTMAN, Meyer, Captain, Cleveland, Fort Jackson, S. C
HARMAN, Howard Engler, Lieut. Colonel, Chillicothe, Ohio, Camp Davis, N. C
HARRISON, Francis Regis, 1st Lieut., East Liverpool, Ohio, Fort Bragg, N. C
HAZEL, Woodrow Sidney, 1st Lieut., Youngstown, Ohio, Lowry Field, Colo
HENGEN, Henry Edward, 1st Lieut., Amherst, Ohio, Fort Jackson, S. C
HICKMAN, Warren R., 1st Lieut., Logansport, Ind., Fort Thomas, Ky
HOLMES, Edward Buchanan, Captain, Parkersburg, W. Va., Fort Knox, Ky
HOLMES, Will Wance, Major, Logansport, Ind., Camp Croft, S. C
HORGER, William Jennings, 1st Lieut., East Liverpool, Ohio, Camp Shelby, Miss
HULLINGER, Clarence William, Major, Springfield, Ohio, Camp Wheeler, Ga
HUMPERT, Joseph Herman, 1st Lieut., Erlanger, Ky., Camp Wheeler, Ga
HUMPHRIES, John Kern, 1st Lieut., Belle Center, Ohio, Camp Shelby, Miss
HUNTER, Howard Marston, 1st Lieut., Hamilton, Ohio, Camp Shelby, Miss
HUNTER, William Byrd, Major, Huntington, W. Va., Fitzsimons General Hospital, Denver
IPP, Herman Harry, 1st Lieut., Youngstown, Ohio, Kelly Field, Texas
JACOB, Samuel Sprigg, III, Captain, Fairmont, W. Va., Fort McClellan, Ala
JAUCH, Roland Schuster, Captain, Rocky River, Ohio, Fort Sam Houston, Texas
JOHN, Henry Jerry, Major, Cleveland, Camp Wheeler, Ga
JOHNSON, Robert Ben, 1st Lieut., Butlerville, Ind., Fort Thomas, Ky
JOHNSTON, Coleman Carnegie, 1st Lieut., Lexington, Ky., Fort Knox, Ky
JOHNSTON, Walter Bailey, Major, Cleveland, Fort Jackson, S. C
JONES, Paul Herdman, Captain, Stockdale, Ohio, Camp Davis, N. C
JUNKERMAN, Carl Schulze, Major, Columbus, Ohio, Camp Shelby, Miss
JUNKERMANN, Edgar Burnett, Major, Columbus, Ohio, Fort Custer, Mich
KAIMON, Morris M., Captain, Akron, Ohio, Fort Buchanan, Puerto Rico
KAYF, Maurice M., Captain, Greenville, Ohio, Fort Jackson, S. C
KARHAN, A. Morton, 1st Lieut., Springfield, Ohio, Fort Sill, Okla
KAUFMAN, Sidney Albert, 1st Lieut., Indianapolis, Fort Jackson, S. C
KEELY, Fred Robert, 1st Lieut., Cleveland Fort Jackson, S. C
KISH, Louis Stephen, 1st Lieut., Cleveland Camp Shelby, Miss
KLOPPER, Edward George, 1st Lieut., Columbus, Ohio, Camp Shelby, Miss
KASILEY, Alan McGreif, Major, Lima, Ohio, Camp Wheeler, Ga
KASILEY, Earl Perry, 1st Lieut., Columbus, Ohio, Camp Claiborne, La
KRAUS, George Robert, Captain, Cleveland Heights, Ohio, Fort Jackson, S. C
KRESS, George Lester, Captain, Warsaw, Ind., Camp Grant, Ill

KUNTZ, Clarence Ignatius, Captain, Fremont, Ohio, Camp Blanding, Fla
LACOCK, Wilford Clare, 1st Lieut., Beverdam, Ohio, Fort Bragg, N. C
LAPP, Henry Thomas, 1st Lieut., Wilmington, Ohio, Camp Forrest, Tenn
LAZARUS, Lawrence B., 1st Lieut., Cleveland, Camp Forrest, Tenn
LEDERER, Henry David, 1st Lieut., Cincinnati, Fitzsimons General Hospital, Denver
LEUCHTAG, Harry Herman, 1st Lieut., Akron, Ohio, Camp Forrest, Tenn
LOEHR, William McWhorter, 1st Lieut., Indianapolis, Fort Sam Houston, Texas
IOTZOFF, Harold Alvin, 1st Lieut., Lima, Ohio, Fort Jackson, S. C
LUCAS, Marvin Andrew, 1st Lieut., Louisville, Ky., Camp Lee, Va
MANNINO, Rosario Gilbert, 1st Lieut., Newark, Ohio, Camp Lee, Va
MARSHALL, John Hugh, Major, Findlay, Ohio, Letterman General Hospital, San Francisco
MARTIN, George Isaac, 1st Lieut., Blanchester, Ohio, Camp Forrest, Tenn
MASON, Everett Elmore, 1st Lieut., Evansville, Ind., Camp Blanding, Fla
MATTEO, Michael Joms, 1st Lieut., Wickliffe, Ohio, Fort Jackson, S. C
MARYANSKI, William Howard, 1st Lieut., Akron, Ohio, Camp Forrest, Tenn
MCALISTER, Thurman Francis, 1st Lieut., Coshocton, Ohio, Fort Bragg, N. C
MCALISTER, Edward Warner, 1st Lieut., Portsmouth, Ohio, Fort Bragg, N. C
MCKINLEY, Melvin Paul, Captain, First Cleveland, Ohio, New Orleans Air Base, La
McMAHAN, Virgil Carrol, 1st Lieut., Bedford, Ind., Ellington Field, Texas
MILLER, Orval Jerome, Captain, Fort Wayne, Ind., Camp Croft, S. C
MINNIG, Donald Irwin, 1st Lieut., Akron, Ohio, Camp Shelby, Miss
MONTGOMERY, Edward Lee, 1st Lieut., Circleville, Ohio, Camp Shelby, Miss
MORRIS, Marion Hamilton, 1st Lieut., Indianapolis, Fort Oglethorpe, Ga
MUELLER, Paul Frederick, 1st Lieut., Lawrenceburg, Ind., Drew Field, Fla
MUSTA, Walter, 1st Lieut., Macedonia, Ohio, Camp Shelby, Miss
MYERS, Ben Vernon, 1st Lieut., Elyria, Ohio, Fort Bragg, N. C
NAUMAN, John Henry, Captain, Martin's Ferry, Ohio, Camp Forrest, Tenn
NEWPORT, Norsuda Monteville, 1st Lieut., Zanesville, Ohio, Camp Grant, Ill
OAKES, Milton Caleb, 1st Lieut., Lexington, Ohio, Camp Shelby, Miss
OSLER, George Edward, 1st Lieut., Newport, Ky., Camp Shelby, Miss
PATTERSON, Owen Findlay, 1st Lieut., Holmesville, Ohio, Lowry Field, Colo
PEABODY, Carroll Alden, 1st Lieut., Cleveland, Brookley Field, Ala
PEEBLES, Thomas Arthur, Major, Loran, Ohio, Fort Hancock, N. J.
POWELEIT, Alvin Charles, 1st Lieut., Newport, Ky., Fort Knox, Ky
PRICE, Walter Samuel, 1st Lieut., Philipsburg, Ohio, Camp Forrest, Tenn
RALSTON, James Gilbert, 1st Lieut., Clarksburg, W. Va., Camp Claiborne, La
RAMSEY, Hugh Smith, 1st Lieut., Bloomington, Ind., Fort Oglethorpe, Ga
RAMSAYER, Herbert Perry, 1st Lieut., Canton, Ohio, Camp Shelby, Miss
RANDALL, Asher, 1st Lieut., Youngstown, Ohio, Fort Bragg, N. C
RANICK, Alden Jasper, Captain, Cromwell, Ind., Camp Lee, Va
RATH, Albert Ernest, 1st Lieut., Wooster, Ohio, Fort Sam Houston, Texas
REHBOCK, Donald Jacob, Captain, Cleveland, Army Medical Museum, Washington, D. C
RIEBEL, John Alan, II, 1st Lieut., Ashland, Ohio, Langley Field, Va
ROBERTS, Donald Russell, 1st Lieut., Elkins, W. Va., Fort Bragg, N. C
ROTHBERG, Maurice, Captain, Fort Wayne, Ind., Fort Oglethorpe, Ga
RUBIN, Milton Raymond, 1st Lieut., Indianapolis, Fort Jackson, S. C
RUNNELS, Scott Clark, Colonel, Cleveland, Camp Shelby, Miss
SADUGOR, Marvin Gerald, 1st Lieut., Cleveland, Fort Benjamin Harrison, Ind
SCHERR, Burton Eldon, 1st Lieut., Clay City, Ind., Ellington Field, Texas
SCHMITT, Richard Klatte, 1st Lieut., Columbus, Ind., Camp Shelby, Miss
SEDAM, Herbert Lawrence, 1st Lieut., Indianapolis, Fort Knox, Ky
SELSHOLTZ, John Rinkes, 1st Lieut., Toledo, Ohio, Fort Bragg, N. C
SEANNETT, William Kelsey, 1st Lieut., Monterey, Ind., Fort McClellan, Ala
SEWELL, Frank Kash, Captain, Jackson, Ky., Fort Screven, Ga
SHAMANSKY, Harry Solomon, Major, Columbus, Ohio, Fort Buchanan, Puerto Rico
SHIELDS, Thomas S., 1st Lieut., Indianapolis, Fort Oglethorpe, Ga
SHORTRIDGE, Wilson Poole, 1st Lieut., Morgantown, W. Va., Pine Camp, N. Y.
SHORTZ, Gerald, 1st Lieut., Kendallville, Ind., Camp Wheeler, Ga
SIEBENTHAL, Ben Jack, 1st Lieut., Bloomington, Ind., Luke Field, Ariz
SIGMUND, William Belmer, Captain, Columbus, Ind., Fort Oglethorpe, Ga
SILVER, Ezra Isreal, 1st Lieut., Cleveland Fort Jackson, S. C
SILVER, Francis Friedman, 1st Lieut., Akron, Ohio, Camp Blanding, Fla
SLICK, Crystal Ray, 1st Lieut., Lima, Ind., Fort Jackson, S. C

SMITH, Merl Bernard, 1st Lieut, Toledo, Ohio, Ellington Field, Texas
 SPARKS, Aubrey Leighton, 1st Lieut, Warren, Ohio, Edgewood Arsenal, Md
 SPEED, George William, 1st Lieut, Springfield, Ohio, Fort Buchanan, Puerto Rico
 STEPHENS, Lowell Ralston, Captain, Covington, Ind, Fort Oglethorpe, Ga
 STRATHMAN, William Henry, Captain, Toledo, Ohio, Fort McClellan, Ala
 STUBBINS, William Matthews, 1st Lieut, Elkhart, Ind, Fort Oglethorpe, Ga
 SUTTLE, Robert Courtney, 1st Lieut, Toledo, Ohio, Camp Wheeler, Ga
 TAYLOR, Clifford Chalmer, Captain, Indianapolis, Fort Sam Houston, Texas
 TAYLOR, David, Captain, Yellow Springs, Ohio, Fort Jackson, S C
 UDELF, Maxwell Spenser, 1st Lieut, Camp Shelby, Miss, Camp Shelby, Miss
 UHRICH, John Henry, 1st Lieut, Fort Wayne, Ind, Air Base, Charlotte, N C
 URBANSKI, Walter Joseph, 1st Lieut, Cleveland, Camp Blending, Fla
 VENABLE, Harry W, 1st Lieut, Louisville, Ky, Fort Benning, Ga

WALES, Homer Louis, 1st Lieut, Indianapolis, Camp Livingston, La
 WALKER, Glenn Harvey, 1st Lieut, Woodville, Ohio, Camp Lee, Va
 WARREN, James Oliver, 1st Lieut, Welch, W Va, Fort Benning, Ga
 WEAVER, Edgar Stephens, 1st Lieut, Scottsville, Ky, Fort McClellan, Ala
 WEINBLATT, Morris, 1st Lieut, Toledo, Ohio, Fort Hayes, Ohio
 WEISER, Richard Wagner, Captain, Cincinnati, Fort Jackson, S C
 WHITE, Harvey Eugene, 1st Lieut, Indianapolis, Fort Jackson, S C
 WILSON, Gerald Newton, 1st Lieut, Columbus, Ohio, Fort Jackson, S C
 WIRTZ, Robert Edward, 1st Lieut, Canton, Ohio, Kelly Field, Texas
 WOLFRAM, Donald J, Captain, Brownsburg, Ind, Camp Lee, Va
 WOOD, Cyrus Rogers, 1st Lieut, Fort Clinton, Ohio, Fort Jackson, S C
 WORK, Charles Edwin, 1st Lieut, Fort Thomas, Ky, Borinquen Field, Puerto Rico
 WYTENBACH, John Edward, Major, Indianapolis, Camp Wheeler, Ga
 ZEIGER, Michael Raymond, Captain, Cleveland Heights, Ohio, Fort Jackson, S C
 ZENO, Ross Russell, 1st Lieut, Akron, Ohio, Fort Jackson, S C
 ZWICK, Harold Frederick, 1st Lieut, Decatur, Ind, Fort McClellan, Ala

SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding Officer, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

BELL, Julius Nathaniel, 1st Lieut, Chicago, Reception Center, Fort Sheridan, Ill
 BERGER, Irving Ray, 1st Lieut, Chicago, U S Army Examination Station, Chicago
 CUTTS, Robert Irving, 1st Lieut, Chicago, Reception Center, Camp Grant, Ill
 DEUTSCH, Hans, 1st Lieut, Chicago, U S Army Induction Station, Chicago
 HAMMER, John M, 1st Lieut, Kalamazoo, Mich, 1605th Corps Area Service Unit, Fort Custer, Mich
 HUNT, Homer Hill, 1st Lieut, Ann Arbor, Mich, Corps Area Laboratory, Fort Sheridan, Ill

JANUS, Arthur Israel, 1st Lieut, Chicago, U S Army Recruiting Station, Chicago
 KOCH, Joseph Melchior, 1st Lieut, Granite City, Ill, Reception Center, Scott Field, Ill
 LEPPERT, Charles L, 1st Lieut, Rockford, Ill, Reception Center, Camp Grant, Ill
 MASSEVER, Alfred J, 1st Lieut, Chicago, Reception Center, Fort Sheridan, Ill
 SCHOLLE, Norbert William, 1st Lieut, Muskegon, Mich, U S Army Induction Station, Kalamazoo, Mich
 SKOPEK, Frank S, 1st Lieut, Saginaw, Mich, U S Army Induction Station, Kalamazoo, Mich
 WEBER, Joseph E, 1st Lieut, Mendota, Wis, U S Army Induction Station, Milwaukee
 WEISDORF, William, Captain, Chicago, U S Army Induction Station, Chicago
 YANOWITZ, Meyer, 1st Lieut, Chicago, Reception Center, Fort Custer, Mich

SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

AGNEW, Lloyd Campbell, 1st Lieut, Iowa City, Corps Area Service Command Station Hospital, Fort Des Moines, Iowa
 ALLEN, Marion Bond, 1st Lieut, Cove, Ark, Corps Area Service Command Induction Station, Jefferson Barracks, Mo
 BASKIN, Abraham Hyman, 1st Lieut, Lincoln, Neb, Corps Area Service Command Station Hospital, Fort Riley, Kan
 BERNET, Henry Scholten, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
 FLEMING, Jacob William, Jr, 1st Lieut, Moberly, Mo, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo
 HOGAN, Clifford William, 1st Lieut, Kensington, Minn, Corps Area Service Command Station Hospital, Fort Snelling, Minn
 LUEDDL, Philip Shryock, Captain, St Louis, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 MCCUISION, Columbus H, Jr, 1st Lieut, Rochester, Minn, Corps Area Service Command Station Hospital, Fort Snelling, Minn

MEYER, Alfred Charles, 1st Lieut, Rochester, Minn, Corps Area Service Command Station Hospital, Fort Snelling, Minn

Orders Revoked

DALTON, Marvin Lewis, 1st Lieut, Brinkley, Ark, Corps Area Service Command Station Hospital, Camp J T Robinson, Ark
 HALPERIN, Philip H, 1st Lieut, Kansas City, Mo, Corps Area Service Command Station Hospital, Fort Leavenworth, Kan
 JOHNSON, Clive Roland, 1st Lieut, Rochester, Minn, Air Corps Station, McChord Field, Tacoma, Wash
 JONES, Otey S, Captain, St Louis
 McCOMAS, Marmaduke D, Captain, Courtland, Kan
 NEUMAIER, Arthur, 1st Lieut, Glencoe, Minn
 SMITH, Louis J, 1st Lieut, New Madrid, Mo
 SMRHA, James A, 1st Lieut, Cedar Rapids, Iowa
 SPIELHAGEN, Guenther F, 1st Lieut, Iowa City
 TAMISIEA, Francis A, 1st Lieut, Missouri Valley, Iowa
 WINDER, Clifford D, Captain, Waterloo, Iowa

Relieved from Active Duty

ABRAMSON, Milton, Captain, Minneapolis, Fort Snelling, Minn
 AGNEW, James Ward, Captain, Iowa City, Fort Des Moines, Iowa
 FREEDMAN, Albert L, 1st Lieut, Iowa City, Fort Des Moines, Iowa

EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

DIENGER, Bernard C, 1st Lieut, Winslow, Ariz, 55th Medical Battalion, Fort Sam Houston, Texas
 SHAPIRO, Jake, 1st Lieut, Conroe, Texas, 45th Division, Camp Barkeley, Texas

TRITT, Earl F, Captain, Dulce, N M, Station Hospital, Camp Wallace, Texas

Relieved from Active Duty

GORDON, Everett J, Captain, 46th Bombardment Squad, 41st Bombardment Group, Tucson, Ariz
 NICHOLS, Ace Elliott, Captain, Gulf Coast Air Corps Training Center, Randolph Field, Texas
 PETERS, Isadore D, 1st Lieut, Station Hospital, Camp Wallace, Texas
 RAY, John Wyeth, 1st Lieut, 64th Medical Regiment, Camp Bowie, Texas

ORDERED TO FOREIGN DUTY

ASHTON, Paul Louis, 1st Lieut, Headquarters, 12th Medical Regiment, BERNARDINI, Camillo Victor, Major, Station Hospital, Sitka, Alaska
 KRANSON, Seymour Julian, Captain, Clayton, Mo, Tripler General Hospital, Honolulu, Hawaii
 MORRISON, Marcus Eugene, 1st Lieut, Columbus, Ohio, Tripler General Hospital, Honolulu, Hawaii
 OLSSON, Paul Bryant, 1st Lieut, Station Hospital, Fort Greeley, Kodiak, Alaska
 RING, Harold Henry, Captain, Tripler General Hospital, Honolulu, Hawaii
 SAUNDERS, George Chancellor, 1st Lieut, Station Hospital, Fort Richardson, Alaska

SCHENTHAL, Joseph Edwin, 1st Lieut, Station Hospital, Fort Amador, Canal Zone
 SCHNEIDER, Louis W, Captain, Montgomery, Ala, Chrl Field, Fort Stotsenburg, Philippine Islands
 SHAW, Vaughn Allison, 1st Lieut, Houlton, Maine, Fort Stotsenburg, Philippine Islands
 STARK, James Andrew, 1st Lieut, Station Hospital, Fort Richardson, Alaska
 TOPP, Olfert Winther, 1st Lieut, Greenville, S C, Borinquen Field, Puerto Rico
 VAN DEVENTER, William Clarke, Captain, N G, Medical Detachment, 250th Coast Artillery, Dutch Harbor, Alaska

ORGANIZATION SECTION

OFFICIAL NOTES

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

The Thirty-Eighth Annual Congress of the Council on Medical Education and Hospitals of the American Medical Association, cooperating with the Federation of State Medical Boards of the United States, will be held at the Palmer House, Chicago, Feb. 16 and 17, 1942. A preliminary announcement of the program follows:

The Effect of the National Defense Program on Medical Practice Among the Civilian Population and on the Maintenance of Accepted Standards in Medical Education and the Cultivation of Research

Ray Lyman Wilbur, M D, Chairman, Council on Medical Education and Hospitals, Stanford University, Calif.

The Relation of the Chemist to Medicine

Vincent du Vigneaud, Ph D, Professor of Biochemistry, Cornell University Medical College, New York.

(Topic to be Supplied)

Rufus C Harris, LL D, President, Tulane University of Louisiana, New Orleans

The Relation of Pharmacology to Therapy.

Soma Weiss, M D, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, Boston

Federal Aid to Education

William P. Munro, Ph D, LL D, Professor of History and Government, California Institute of Technology, Pasadena

The Effect of the War on Medical Education in Canada

J C Meakins, M D., Dean, McGill University Faculty of Medicine, Montreal, Quebec.

Current Medical Personnel Problems of the Army

Col George F. Lull, M D, Chief, Personnel Division, United States Army Medical Corps, Washington, D C. (Representing the Surgeon General of the United States Army)

Medical Education from the Standpoint of the Navy Medical Corps

Rear Admiral Ross T McIntire, Surgeon General, United States Navy, Washington, D. C.

Needs of the Public Health Service for Medical Personnel in National Defense Activities.

Thomas Parran, M D, Surgeon General, United States Public Health Service, Washington, D C

Selective Service and Medical Students

Brig. Gen. Lewis B. Hershey, Director, Selective Service System, Washington, D. C.

The Committee on Medical Preparedness of the American Medical Association

Irvin Abell, M D, Chairman, Committee on Medical Preparedness of the American Medical Association and Chairman, Health and Medical Committee of the Federal Security Agency, Louisville, Ky.

Medical Education in the Preparedness Program

Harold S. Diehl, M D, Dean, University of Minnesota Medical School, Minneapolis, and Member, Procurement and Assignment Service for Physicians, Dentists and Veterinarians of the Office of Defense, Health and Welfare Services

Access to Hospital Records—Some Legal Aspects.

T V. McDavitt, Bureau of Legal Medicine and Legislation, American Medical Association, Chicago

The Function of the State Hospital as an Educational and Social Agency.
Winfred Overholser, M D, Medical Superintendent, St. Elizabeths Hospital, Washington, D C.

Summary of the Work of the Council on Industrial Health of the American Medical Association

S. J. Seeger, M D, Chairman, Council on Industrial Health, American Medical Association, Texarkana, Texas.

The Integrated Course in Anatomy as Related to Licensure

B I Burns, M D, Dean, Louisiana State University School of Medicine, New Orleans

Teaching of Professional Ethics in Medical Schools

Arthur T. McCormack, M D, State Health Commissioner, Louisville, Ky.

Citizenship as Related to Licensure.

Walter E Vest, M D, President, Public Health Council, West Virginia Department of Health, Huntington.

Accelerating Medical Training in Canada

E Stanley Ryerson, M D, Assistant Dean, University of Toronto Faculty of Medicine, Toronto, Ontario.

Industrial Health as Related to Licensure.

C O. Sappington, M D, Executive Director, American Conference on Industrial Health, Chicago

Licensure Problems in the District of Columbia

George C Ruhland, M D, Secretary-Treasurer, Commission on Licensure, Washington, D C.

Have Basic Science Laxis Advanced the Practice of Medicine?

Thomas J. Crowe, M D., Secretary, Texas Board of Medical Examiners, Dallas.

Revision of the Constitution and By-Laws of the Federation of State Medical Boards

T V. McDavitt, Bureau of Legal Medicine and Legislation, American Medical Association, Chicago

Morris Fishbein, M.D, Editor, THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Chicago, will be the guest speaker at the Annual Dinner of the Federation of State Medical Boards on Monday, February 16. His topic will be:

American Medicine and the National Emergency.

THE ATLANTIC CITY SESSION

Motion Pictures in the Scientific Exhibit

The Committee on Scientific Exhibit is arranging a motion picture program for the Atlantic City session. Motion pictures will be shown only in theaters provided for the purpose rather than in the exhibitor's booth. Six or more such theaters will show pictures simultaneously and continuously throughout the week.

Application blanks for a place on the motion picture program may be obtained from the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 165 has passed the Senate and House, providing for continuing in the service of the Army, Navy, Marine Corps and Coast Guard beyond the term of their enlistment those suffering from service connected diseases or injury who are in need of further medical care or hospitalization. S. 1826 has passed the Senate and House, permitting seeing-eye dogs to enter government buildings when accompanied by their blind masters

Bills Introduced.—H. Res. 337, introduced by Representative Celler, New York, proposes to create a committee of five members of the House of Representatives to study, investigate and report to the House on the proposals that have been made for amendment of the Social Security Act, including a proposal to increase the number of persons to be embraced within the benefits of that act so as to include domestics, farm operators, agri-

cultural workers, employees in nonprofit institutions, casual laborers, employees of state and local governments, professional men and women, and other self-employed persons. H. J. Res. 250, introduced by Representative Bloom, New York, proposes to grant permission to Thomas Parran, Surgeon General of the United States Public Health Service, Bolivar J. Lloyd, Medical Director (retired), Howard F. Smith, Medical Director, Herbert A. Spencer, Medical Director, and Gilbert L. Dunna-hoo, Surgeon, all of the United States Public Health Service, to accept and wear certain decorations bestowed on them by the governments of France, Cuba, Chile, Finland and Luang-Prabang. H. R. 6029, introduced by Representative Knutson, Minnesota, H. R. 6055, introduced by Representative Reece, Tennessee, H. R. 6111, introduced by Representative Tibbott, Pennsylvania, and H. R. 6136, introduced by Representative Maciejewski, Illinois, propose to amend section 2800 of the Internal Revenue Code, to authorize the Commissioner of

Internal Revenue to make a refund of the distilled spirits tax, at the rate of \$1 per gallon, to any person who has used distilled spirits, produced in a domestic registered distillery or industrial alcohol plant, in the manufacture or production of an article intended for use for nonbeverage purposes, subject to certain limitations. H. R. 5827, introduced by Representative Sauthoff, Wisconsin, proposes to require a mental examination of the accused prior to trial of any charge by Army general court martial. H. R. 6030, introduced by Representative Kunkel, Pennsylvania, proposes to amend an act to provide books for the adult blind by increasing the annual appropriation from \$275,000 to \$350,000, by authorizing the purchase of periodicals in addition to books, and by providing that not less than \$2,500 of the sum allocated for books and periodicals in raised characters shall be expended for the publication in braille, for the exclusive use of the deaf-blind, of the magazine of the American League for the Deaf-Blind known as the *Bulletin Board*. H. R. 6069, introduced by Representative Hook, Michigan, provides that after March 11, 1941 all members of the armed forces of the United States shall be entitled to the same benefits awarded to members of the armed forces of the United States as under the World War Veterans' Act of June 7, 1924. H. R. 6106, introduced (by request) by Representative Rankin, Mississippi, proposes to provide liberalized benefits for disabled American veterans of the World War and their dependents. This bill, among other things, provides that in the administration of laws pertaining to veterans, retired officers and enlisted men of the Army, Navy, Marine Corps and Coast Guard, who served

honorably during a war period as recognized by the Veterans' Administration, shall be entitled to hospitalization and domiciliary care in the same manner and to the same extent as veterans of any war are now or may hereafter be furnished hospitalization or domiciliary care by the Veterans' Administration. H. R. 6135, introduced by Representative Lanham, Texas, proposes to authorize an additional appropriation of \$150,000,000 to construct community facilities in defense areas, including hospitals, health centers and clinics. H. R. 6138, introduced by Representative Clason, Massachusetts, provides that any person claiming to be a citizen of the United States at birth, in whose case no official record of birth is available, may apply to the Commissioner of Immigration and Naturalization for a certificate of citizenship.

DISTRICT OF COLUMBIA

Change in Status.—H. R. 5694 has passed the House and has been reported to the Senate, proposing to prevent the sale of unwholesome food in the District of Columbia. A similar bill, S. 2045, was introduced by Senator McCarran, Nevada.

Bill Introduced.—H. R. 6097, introduced by Representative D'Alesandro, Maryland, provides that the National Hospital Service Society, Incorporated, shall be considered to be a fraternal organization and shall be permitted to do business without further license or permit, exempt from the provisions of the insurance laws relating to the District of Columbia.

MEDICAL ECONOMIC ABSTRACTS

MEDICAL CHANGES IN BRITAIN

Bombing and overcrowded insanitary shelters led the British to anticipate epidemics, says Ritchie Calder in *John O'London's Weekly* (April 25, 1941). But when a body of American experts under Prof. J. E. Gordon of Harvard arrived they found that the expected epidemic had failed to materialize.

In fact, the shelters had a lower disease rate than the average for the country. And the country as a whole, apart from the war epidemic of "spotted fever," or cerebrospinal meningitis, due mainly to the bringing together of young people under dormitory conditions, in the army and other ways, could show a bill of health comparable with the good years immediately before the war.

Although the war has not yet brought epidemics, it has created problems in the organization of medical services. There have been many proposals for changes in the panel system, which this writer says "no one would dare to pretend . . . has been satisfactory." It is generally agreed that the "approved society" system is wasteful. The British Medical Association has proposed to extend the panel system to dependents, but the first effect of this would be to make nearly double the sales value of existing practices, which would compel physicians to pay some \$10,000 to start in practice.

The voluntary hospital system has been heading for bankruptcy for several years—a fate which increased gifts and hospitalization insurance have only postponed.

As a result of the war, some of these hospitals began, for the first time in history, to bank money. They were paid by the state to keep the beds empty for casualties. The government leased these beds at anything from two and a half guineas to seven guineas a week (about \$8 to \$25). The hospitals were then able to lease emergency hospitals, built by the state, with the help of the bed rent from the state. This paradoxical device maintained the façade of the voluntary system. And since the war began, hospitals have been among the main targets of the Nazi air raiders, and an essential part of the postwar replanning will have to deal with their rebuilding.

Private practice has been hard hit. Large numbers of doctors have been recruited for the forces and others taken into the government's hospital scheme. Expansion of industrial practice and special shelter service have taken others, and evacuations and the creation of "defense areas" have caused widespread dislocations. It has also brought some steps toward reorganization and numerous proposals for reconstruction after the war. A "regional plan" for hospitals to include both voluntary and government operated hospitals has been developed, and there

seems to be a trend toward state medicine with salaried physicians as part of an integrated system.

Manifestly the old order in medicine is finished.

One thing is certain: We shall have the right to demand after this not the sickness service, which is all we have got at the moment, but a health service, embracing the whole population, irrespective of income, and providing medical care from birth to death, not as a purchasable commodity, but as an inalienable right. That service would conceive health as a biological trinity—protective medicine, which includes nutrition and environment (positive health); preventive medicine, which is the public health services, our pickets against disease; and curative medicine, including early diagnosis and highly skilled treatment, with all the resources of modern medical science and practice.

COMPULSORY SICKNESS INSURANCE IN CALIFORNIA

The proposal to secure signatures for a referendum for compulsory sickness insurance in California received a setback when the members of the influential Commonwealth Club voted opposition to any such system of sickness insurance.

To the question "Do you favor the establishment by government of a system of compulsory sickness insurance (health insurance)?" eight hundred and seventy-one members voted No and four hundred and ninety-one members voted Yes.

Ballots on this question were mailed to all of the Club's four thousand four hundred members following a study by the Public Health Section and publication of pro and con reports on the issue.

TUBERCULOSIS MORTALITY

In 1900 there were 200 deaths per hundred thousand annually from tuberculosis in the United States, according to the statisticians of the Metropolitan Life Insurance Company. In 1921 that rate had been halved and in 1940 the reports now available indicate that it will be more than halved again, since it will be a little less than 45 per hundred thousand. However, the rate of decrease seems to be slowing up. The year 1936 even showed a slight increase. Contrary to expectations, the rate of decline was a little faster during the greatest depression years than in some of the subsequent years. In 1940, twelve states had death rates from tuberculosis below 30 per hundred thousand and six of 20 or less per hundred thousand.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Supervisor of Student Health Service.—Dr. William J. Norris has been appointed university physician and will take general charge of the student health service on the Los Angeles campus of the University of California. He will not replace Dr. Donald S. MacKinnon, physician for men, or Dr. Lillian R. Titcomb, physician for women, according to the University *Clip Sheet*. Dr. Norris was formerly connected with the Los Angeles campus, serving as physician for men from 1921 to 1932. He graduated at Columbia University College of Physicians and Surgeons, New York, in 1918. The *Clip Sheet* stated that the appointment of Dr. Norris anticipates the building of a \$1,000,000 Student Health Center and Hospital on the Los Angeles campus.

Dr. Housman Resentenced to San Quentin.—Superior Judge Lile T. Jacks sentenced Dr. Nathan S. Housman, San Francisco, on October 24, to serve from one to fourteen years in San Quentin, on conviction of perjury and offering and preparing false evidence in connection with an earlier trial for failure to keep proper records of narcotic prescriptions. This judgment was a resentence, confirming an earlier sentence on three counts to run concurrently. Dr. Housman was first sentenced on June 13, 1940 after the court had denied motion for a new trial. He had been indicted Nov. 1, 1939 on six counts: two of perjury, two of preparing false evidence and two of offering false evidence. He appealed to the state appellate court and then the state supreme court. His appeal to the U. S. Supreme Court to review his case failed.

COLORADO

Place of Annual Session.—The Colorado State Medical Society has announced that its seventy-second annual session will be held in Colorado Springs, Sept. 23-26, 1942.

Industrial Hygiene Division.—The Colorado industrial hygiene unit, formerly a section of the division of sanitary engineering, has been established as a separate division of the state board of health, it was announced in September. Mr. R. J. Owens is director of the new division.

The Friedman Lectures.—The William S. Friedman Lectures, sponsored by the National Jewish Hospital, Denver, in cooperation with the Denver County Medical Society and the University of Colorado School of Medicine, Denver, were delivered in November by Drs. Jesse G. M. Bullowa, clinical professor of medicine, New York University College of Medicine, New York, and Leo Eloesser, clinical professor of surgery, Stanford University School of Medicine, San Francisco. Dr. Bullowa spoke on "Chemotherapy in the Pneumonias and the Immunity Reactions" and Dr. Eloesser on "Causes of Cavitation in Pulmonary Tuberculosis." At a special meeting of the Medical Society of the City and County of Denver on November 18 Dr. Eloesser discussed "Compound Fractures in War Time" and Dr. Bullowa "Pneumonias in the Infectious Diseases of Childhood." Both men conducted clinics. Local physicians also participated in the program.

ILLINOIS

State-Subsidized Tumor Diagnostic Service.—The second state-subsidized tumor diagnostic service has been established at the Methodist Hospital of Central Illinois, Peoria, with the approval of the Peoria County Medical Society. The first was begun at the Memorial Hospital of Springfield on October 1. Plans for a tissue diagnostic service at the Marshall Browning Hospital, Du Quoin, have been approved by the Perry County Medical Society and it is expected that this unit will soon be in operation. Although the program for this diagnostic service is administered by Dr. Raymond V. Brokaw, chief of the division of cancer control of the state department of health with headquarters in Springfield, the actual management of the services will be the responsibility of the selected hospitals which are chosen by the local medical society. These tumor diagnostic services are designed to provide for the gen-

eral practitioner a competent consultation service without cost for his suspected cancer cases. The facilities will be available to every physician for the reference of his case for diagnosis and recommendation as to treatment, the patient being returned to the physician for further action. No treatment is to be rendered by this service in any case. The tissue diagnostic service provided for by the 1939 legislature was inaugurated in September 1940 as a function of the division of laboratories of the health department at 1800 West Fillmore Street, Chicago. The act creating the division of cancer control provided for an advisory board of seven members to be appointed by the governor. To make these appointments "the governor shall invite nominations from recognized medical organizations of this state," and no less than four members should be recognized authorities in the cancer field, and at least four should be physicians. At present the board consists of Drs. David J. Davis, Chicago, chairman; William M. Cooley, Peoria; Fauntleroy Flinn, Decatur; Roswell T. Pettit, Ottawa; James S. Templeton, Pinckneyville; John A. Wolfer, Chicago, and Edwin F. Hirsch, Chicago, secretary.

CHICAGO

Symposium on Old Age.—The Chicago Medical Society devoted its December 10 meeting to a symposium on old age. Speakers were Edmund V. Cowdry, Ph.D., St. Louis, on "The Problem of Aging"; Dr. Wilber E. Post, "Medical Management of the Aging Patient"; Dr. Lester R. Dragstedt, "The Aged Patient as a Surgical Risk," and Dr. Francis J. Gerty, "Psychologic Problems in the Aging Patient."

Annual Surgical Prize.—The Chicago Surgical Society announces that competition for the 1942 annual prize is now open to young men devoting themselves to surgery in Cook County and who are not members of the society. A prize of \$250 will be awarded for the most meritorious original investigation in one or both of the fields of experimental and clinical surgery. The paper submitted should be of original work which has not been printed or presented previously. The manuscript should bear no identification marks of author, hospital or institution but should be accompanied by a sealed envelop bearing on its outside the title of the paper and containing within the name and address of the author. No award will be made if no paper submitted is deemed worthy. Manuscripts should be sent to the secretary of the Chicago Surgical Society, 54 East Erie Street, not later than March 1.

INDIANA

Personal.—Dr. Charles P. Anderson, assistant superintendent of the health department in Durham, N. C., has been appointed director of the School Medical Service of Gary. Dr. Robert A. Nason, Garrett, has been appointed coroner of DeKalb County, filling the unexpired term of the late John R. Clark, Auburn. Dr. Harley F. Flannigan, Lagrange, has been named health commissioner of Lagrange County, succeeding Dr. Frank Morse Nichols, Topeka, resigned. Dr. Nichols and his family are moving to Warsaw.

District Meeting.—The Third District Medical Society was addressed in French Lick, November 5. Dr. Carl P. Huber, Indianapolis, opened the session with a discussion of "Normal Delivery, Episiotomy, Forceps and Cesarean Section." Other speakers were Drs. Minor W. Miller, Evansville, on syphilis; Arthur F. Weyerbacher, Indianapolis, gonorrhea; R. Hayes Davis, Louisville, pneumonia; Russell A. Sage, Indianapolis, ear infections; Wendell D. Little, Indianapolis; Louis H. Segar, Indianapolis, rheumatic fever; George J. Garceau, Indianapolis, fractures; Louis Wallace Frank, Louisville, peptic ulcer, and James O. Ritchey, Indianapolis, the after dinner speaker, "Endocrine Disorders."

KANSAS

Rehabilitation Program Begun.—The Kansas State Board of Health, Topeka, is sponsoring a program of rehabilitation of selective service registrants who have been rejected for military service by reason of physical disabilities. Statistical information on registrants who are afflicted with diseases of the lungs and venereal disease is now being assembled, the program to be extended into other fields when facilities permit.

Society News.—The Wyandotte County Medical Society will be addressed, December 16, at its annual meeting by Dr. James W. May on "Common Tumors of the Eye." Dr. Tom R. Hamilton spoke on "Blood Cultures in Clinical Pathology" at the society's meeting December 2 and Dr. Ward W. Summerville, "The Friedman Test." All are from Kansas City.

MINNESOTA

Society News.—Karl F. Meyer, Ph.D., of the George Williams Hooper Foundation for Medical Research, University of California, San Francisco, will address the Minnesota Pathological Society in Minneapolis, December 16, on "The Animal Kingdom, a Reservoir of Infection." The society was addressed, November 18, by Melvin H. Knisely, Ph.D., Chicago, on "Effects of Plasmodium Malariae on the Blood Vascular System."

Medals Awarded.—Dr. Edward H. Juers, Red Wing, recently received the annual medal of the Southern Minnesota Medical Association for his paper on epiloitis. The medal is given to the author of the paper considered best on the program of the association's annual meeting. The medal for a case history presented on the annual program went to Dr. Peter E. Hermanson, Hendricks, whose report dealt with a case of pregnancy occurring outside the uterus.

NEVADA

District Meeting of Indian Service.—The U. S. Indian Service conducted a district medical meeting for California, Nevada and Utah in Reno, November 12-13. Included among the speakers were:

- Dr. Ralph B. Snively, San Francisco, Indian Health and National Defense.
- Dr. Fred T. Foard, San Francisco, Defense Created Public Health Needs in the Western States.
- Dr. Hubert V. Hailman, Salt Lake City, Trachoma, the Enigma.
- Dr. Horace De-Lien, San Francisco, Case Finding in Tuberculosis.
- Dr. Michel Pijon, Owyhee, A Study of Vitamin Deficiencies at Western Shoshone.
- Dr. Roland W. Stahl, Reno, Role of Histamine in Allergy.
- Mr. Don C. Foster, superintendent, Carson Indian Agency, Stewart, History of Development of Indian Service in Nevada.
- Mr. W. W. White, sanitary engineer, Nevada State Health Department, Reno, Sanitary Engineering Aspects of Communicable Disease Control.

NEW JERSEY

Society News.—Dr. Irving S. Wright, New York, will discuss "Peripheral Vascular Diseases" before the Bergen County Medical Society, Hackensack, December 9.—The Passaic County Medical Society devoted its meeting in Paterson on November 13 to a discussion of "State Medicine—Its Trends." The speakers were Drs. Thomas K. Lewis, Camden, and Leroy A. Wilkes, Trenton, president and executive officer respectively of the Medical Society of New Jersey.—Dr. Aaron H. Neffson, New York, addressed the Monmouth County Medical Society in Matawan, November 26, on "Management of Acute Laryngotracheobronchitis."—The Camden County Medical Society was addressed in Camden, December 2, on "Surgical Therapy in Lesions of the Large Bowel."

NEW YORK

Rochester Academy Rededicates Museum.—The Rochester Academy of Medicine, Rochester, rededicated its medical museum to Dr. John R. Williams, chairman of the museum commission, November 16. A reception to guests opened the program and speakers included Dr. William J. Merle Scott, president of the academy; Dr. George H. Whipple, professor of pathology and dean, University of Rochester School of Medicine and Dentistry; Dr. Walter B. Cannon, George Higginson professor of physiology and head of the department, Harvard Medical School, Boston, and Dr. Williams. The museum and auditorium are located in a new wing adjoining the academy's home, which was the gift in 1938 of the daughters of E. P. Lyon in memory of their parents. A feature of the medical museum is a memorial frieze in which is recognized the fundamental contributions made by twenty-four North American scientists in the past hundred and fifty years. Those honored in the frieze are:

- Dr. Benjamin Rush, Philadelphia.
- Dr. William Beaumont, St. Louis.
- Dr. Crawford W. Long, Athens, Ga.
- Dr. William T. G. Morton, New York.
- Dr. Oliver Wendell Holmes, Cambridge, Mass.
- Dr. Ephraim McDowell, Danville, Ky.
- Dr. Silas Weir Mitchell, Philadelphia.
- Dr. Edward L. Trudeau, Saranac Lake, N. Y.
- Dr. Theobald Smith, Princeton, N. J.
- Dr. Howard T. Ricketts, Chicago.
- Dr. Hans Zinsser, Boston.
- Dr. Harvey Cushing, New Haven, Conn.
- Lafayette B. Mendel, LL.D., New Haven, Conn.
- Elmer V. McCollum, Sc.D., Baltimore.
- Dr. William C. Gorgas, Washington, D. C.
- Dr. Walter Reed, Washington, D. C.
- Dr. Abraham Jacobi, New York.
- Dr. William Osler, Oxford, England.
- Dr. Walter B. Cannon, Boston.
- Dr. James B. Herrick, Chicago.
- Dr. Frederick G. Banting, Toronto.
- Dr. Charles H. Best, Toronto.
- Dr. George R. Minot, Boston.
- Dr. Whipple.

Another feature is a mural in which is portrayed the contributions of medicine to modern civilization. There are in the

museum twenty-three glass cases of priceless memorabilia. Special guests at the dedication included relatives of the honored scientists. In 1936 the medical museum of the Rochester Academy of Medicine was organized as a division of the Rochester Museum of Arts and Sciences.

New York City

Annual Fraternity Lecture.—The Tau chapter of Nu Sigma Nu will offer its annual open lecture, December 15, in the auditorium of Cornell University Medical College. Dr. George J. Heuer, professor of surgery at Cornell will deliver the lecture on "William S. Halsted."

Committee for Russian War Relief.—A Medical Center Committee to Aid Russian War Relief was recently organized with Dr. Tracy J. Putnam, director of the Neurological Institute of New York, as chairman; Dr. Alwin M. Pappenheimer, professor of pathology, Columbia University College of Physicians and Surgeons, treasurer, and Elvin A. Kabat, Ph.D., of the Neurological Institute, secretary. Members of the staffs of the various units forming the Medical Center at 168th Street and Broadway are included in the membership of the committee, which has for its purpose the collection of medical supplies and instruments for the relief of the Russian people.

Ophthalmologists Honored.—Dr. John E. Weeks, professor of ophthalmology emeritus, New York University College of Medicine, was guest of honor at a dinner, October 6, attended by eighty friends and students. Dr. Daniel B. Kirby, professor of ophthalmology at the university, was toastmaster. At the dinner it was announced that the Eye Surgery Fund, a local corporation, had been dedicated to the late Dr. Webb W. Weeks, professor of ophthalmology. The fund is now directed by a medical board consisting of certain members of the faculty of the department of ophthalmology of New York University College of Medicine and of the staff of the department of ophthalmology of Bellevue Hospital. It aims to promote and aid research in surgery of the human eye, disseminate knowledge in this field among physicians and particularly to perform such work as may aid the indigent in need of eye surgery or medical care. While the scope of the fund is now local in character, it is hoped to extend it to a national basis.

NORTH CAROLINA

Dr. Royster Observes Seventieth Birthday.—The Raleigh Academy of Medicine was entertained at a dinner November 19, by Dr. Hubert A. Royster to celebrate his seventieth birthday. Dr. Royster is a descendant of one of the founders of the academy, Dr. Wisconsin I. Royster. The speakers included Drs. Chauncey L. Royster, Raleigh, nephew of the host, on "Early Diagnosis of Shock." Two sons, Dr. Henry P., Philadelphia, and Hubert A. Jr., Bryn Mawr, Pa., spoke on "Nutrition in Surgical Patients" and "Resuscitation of the Newborn," respectively. Dr. Royster was born in Raleigh on Nov. 19, 1871. He graduated at the University of Pennsylvania School of Medicine, Philadelphia, in 1894. He was dean and professor of gynecology at the University of North Carolina Medical Department, Raleigh, from 1902 to 1910 and since 1935 has been professor of surgery at Wake Forest College, now known as the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem. He was president of the Raleigh Academy of Medicine in 1905, of the Tri-State Medical Association in 1906 and the North Carolina State Medical Society in 1921-1922. Dr. Royster served as chairman of the Section on Surgery, General and Abdominal, of the American Medical Association in 1931-1932.

OHIO

Society News.—Dr. Gordon F. McKim, Cincinnati, addressed the Montgomery County Medical Society in Dayton recently on "Infections of Upper Urinary Tract."—Dr. Claude S. Beck, Cleveland, discussed "Heart Disease Treated by Operation" before the Mahoning County Medical Society, November 18.

Henry Freiberg Memorial.—The Journal of Medicine for November was dedicated to the memory of Dr. Henry B. Freiberg, who at the time of his death in January was assistant professor of clinical surgery (urology) at the University of Cincinnati College of Medicine. Dr. Freiberg was at one time secretary of the Cincinnati Academy of Medicine which, with other societies, publishes its proceedings in the Journal of Medicine.

Commission for the Blind.—Dr. Albert D. Frost, Columbus, has been elected president of the Ohio Commission for the Blind. Other members are Walter Schmitt, Cincinnati; Henry J. Robison, chief of the division of social administra-

tion, state department of public welfare, and Byron P. Redman, Columbus; Mrs. J. D. Johnson, Celina, and W. G. Scarborough, superintendent of the Ohio State School for the Blind, Columbus.

PENNSYLVANIA

Academy of Physical Medicine.—The Pennsylvania Physical Therapy Association has changed its name to the Pennsylvania Academy of Physical Medicine, according to an announcement from Dr. Alfred J. M. Treacy, Philadelphia, secretary. At its meeting, November 21, the group was addressed by Drs. William H. Schmidt, Philadelphia, on "Treatment of Peripheral Vascular Diseases"; Albert A. Martucci, Philadelphia, "Treatment of Anterior Poliomyelitis," and Oscar T. Wood Jr., Philadelphia, "Treatment of Painful Conditions of the Shoulder."

Philadelphia

British Psychiatrist Gives Weir Mitchell Oration.—Dr. Robert D. Gillespie, London, chief psychiatrist of the British Royal Air Force, delivered the ninth Weir Mitchell Oration of the College of Physicians of Philadelphia, November 30. His topic was "Psychoneuroses in Peace and War, and the Future of Human Relationships."

Pittsburgh

Annual Scientific Day.—The annual "scientific day" of the Montefiore Hospital Association of Western Pennsylvania was held in Pittsburgh, November 15. The program included two clinical sessions and an address by Dr. Ira I. Kaplan, New York, entitled "What Radiation Can Offer in Medicine and Surgery."

The Renziehausen Memorial Lecture.—Dr. Henry Rawle Geyelin, assistant clinical professor of medicine, Columbia University College of Physicians and Surgeons, New York, delivered the sixth Renziehausen Memorial Lecture at the meeting of the Allegheny County Medical Society, November 18. His subject was "Clinical Aspects of Diabetes Mellitus."

Society News.—Dr. Meredith F. Campbell, New York, discussed "Urinary Tract Obstructions in Infancy and Children" before the Pittsburgh Urological Association, November 10, in cooperation with the Pittsburgh Pediatric Society. The Pittsburgh Academy of Medicine devoted its meeting, November 11, to a panel discussion of sulfonamide therapy with the following speakers: Drs. Robert R. Clark, general practice; James M. Strang, internal medicine; Harold G. Kuehner, surgery; Howard H. Permar, pathology; Adelbert Boyd Miller Jr., otolaryngology; James J. Lee, urology, and Theodore O. Elterich, pediatrics. Among others, Dr. Julian M. Rogoff addressed the Pittsburgh Surgical Society, November 14, on "Surgical Aspects of Adrenal Cortex."

RHODE ISLAND

Personal.—Dr. Peter F. Harrington, Providence, has been appointed director of a new division of tuberculosis control in the Providence health department.

Sectional Meeting of College of Physicians.—A New England sectional meeting of the American College of Physicians will be held at Providence, January 14. A tentative announcement lists clinical sessions at the Peter's House at Rhode Island Hospital, under the supervision of Dr. Charles F. Gormly, and scientific discussions at the auditorium of the Rhode Island Medical Library. A dinner at the Squantum Club will conclude the day's program.

SOUTH CAROLINA

Conference on Student Health.—The second annual South Carolina Conference on Student Health, sponsored by the South Carolina Tuberculosis Committee and the National Student Health Association, was held in Orangeburg, November 28-29. The program included a panel discussion on "Present Status of Health Programs in Our Colleges" and committee meetings devoted to "Control of Tuberculosis and Venereal Diseases in Colleges" and "What Shall Health Instruction Include?" The speakers included Dr. Paul B. Cornely, associate professor of preventive medicine and public health, Howard University School of Medicine, Washington, D. C., on "Implications of Draft Rejections to College Health Programs." Dr. Cornely was guest consultant and adviser during all professional sessions of the conference.

VIRGINIA

Postgraduate Clinic.—The twenty-eighth postgraduate clinic of the University of Virginia Department of Medicine and the department of clinical and medical education of the

Medical Society of Virginia was held in Charlottesville, November 14-15. The program consisted of a symposium on gastroenterology and speakers included:

Dr. Porter P. Vinson, Richmond, Va., Diseases of the Esophagus.
Dr. Julian M. Ruffin, Durham, N. C., Present Status of Gastroscopy.
Dr. Chester M. Jones, Boston, Clinical Significance of "Gastritis."
Dr. Thomas T. Mackie, New York, Deficiency States and the Gastrointestinal Tract.
Dr. Warren T. Vaughan, Richmond, Gastrointestinal Manifestations of Allergy.
Dr. Thomas Grier Miller, Philadelphia, Intestinal Intubation.
Dr. William Osler Abbott, Philadelphia, Drugs and the Gastrointestinal Tract.

WASHINGTON

Changes in Health Officers.—Dr. Russell H. Wilson, Bremerton, has been appointed in charge of the Kitsap County health department, succeeding Dr. Harald M. Graning, who was assigned to the Plague Laboratory of the U. S. Public Health Service at San Francisco. Dr. Enil E. Palmquist, Colfax, health officer of Whitman County, has been granted six months' leave of absence to study health administration at the University of Michigan, Ann Arbor. During his absence Dr. Philip J. Holabach, Colfax, will be health officer. Dr. Theodore G. Lathrop, White Salmon, has been appointed acting health officer of Klickitat County.

WYOMING

New Head of Venereal Disease Program.—Dr. Nephi H. Savage, director of the division of epidemiology of the Wyoming State Department of Public Health, Cheyenne, has taken over direction of venereal disease problems in the state, according to *Western Public Health*. Private practitioners will be offered a personal consultation service, and a fourth free venereal disease clinic will be opened soon at Laramie, it was announced.

HAWAII

Federal Grant for Hospital Addition.—Queen's Hospital, Honolulu, has been allowed a grant of \$250,000 from the Federal Works Agency, Washington, D. C., to finance the construction of a one hundred bed wing. The hospital will provide the funds for furnishings and equipment. An appropriation has also been given to the hospital to increase the school of nursing by twenty-five students, bringing the student roll up to one hundred.

GENERAL

Impostor Claims Relationship to Dr. Moorman.—Dr. Lewis J. Moorman, Oklahoma City, writes that a young woman has been traveling about the country calling on physicians and representing herself either as a patient or as a relative of his. The woman then presents a fraudulent check to pay her bill, getting the remainder of the check in cash. In many instances the woman has used the name Marianne Hunt. The name of Miriam Brown has also been used. Dr. Moorman, in disclaiming any knowledge or relationship, urges physicians to be on the watch for this woman.

Residency in Anesthesiology.—Applications are now being received for appointment of two residents in anesthesiology at the Cook County Hospital, Chicago, in 1942. The appointments will be for three years, with salary and full maintenance, and the training provided will lead to certification by the American Board of Anesthesiology. The residencies are open to recent graduates of approved internships. Dr. Hugh O. Brown, formerly first assistant in the section on anesthesia, blood transfusion and intravenous therapy of the Mayo Clinic, Rochester, Minn., is director of the department of anesthesia at Cook County Hospital.

Russian Government Asks for Books.—An urgent request from the Soviet government for American medical books to supplement the Central Medical Library was received on November 19 at the offices of Russian War Relief, Inc., 535 Fifth Avenue, New York. The list, comprising almost a hundred titles, includes books on brain, spine and neurologic surgery. According to the announcement the Russian government offered to exchange important recent Soviet literature on medicine for some of the more urgently needed volumes in the listing, such as Albee's "Bone Graft Surgery in Disease, Injury and Deformity," Brock's "Injuries of the Skull, Brain and Spinal Cord: Neuropsychiatric, Surgical and Medicolegal" and Hertzler's "Surgical Pathology of Diseases of the Mouth and Jaws."

Conference on Tuberculosis Establishes New Award.—The Mississippi Valley Conference on Tuberculosis at its recent meeting in Columbus, Ohio, presented the first Hoyt E. Dear-

holt Medal to Robert G. Paterson, Ph.D., Columbus, executive secretary of the Ohio Public Health Association. The medal was established last year as a tribute to the late Dr. Dearholt's devotion, service and leadership in tuberculosis work, particularly in the formation of the Mississippi Valley Conference. Dr. Dearholt was for many years executive secretary of the Wisconsin Anti-Tuberculosis Association.

Annual Forum on Allergy.—The fourth Annual Forum on Allergy will be held at the Hotel Statler, Detroit, January 10-11. On Friday preceding the Forum there will be a conducted trip to the allergy clinic of the University of Michigan, Ann Arbor, where the program will be presented by Dr. John M. Sheldon and his staff. Saturday will be given over to a series of study groups at which the speakers will include:

Dr. Karl D. Figley, Toledo, Ohio, Perennial Allergic Coryza.
Dr. Franz L. Blumenthal, Detroit, Contact Dermatitis.
Dr. Theodore L. Squier, Milwaukee, Food Allergy.
Dr. French K. Hansel, St. Louis, Tonsillectomy, Sinus Surgery, and Local Treatment in Nasal Allergy.
Dr. Howard J. Lee, Oshkosh, Wis., Gastrointestinal Allergy, Cyclic Vomiting, and Beginning Migraine.
Dr. Leon Unger, Chicago, Allergic Conjunctivitis.

Saturday evening Dr. Benjamin S. Kline, Cleveland, will discuss "Observations on the Pathology of Allergy" and Dr. Benjamin C. Houghton, Columbus, will show a motion picture on "The Reaction of Sensitized Cells Growing in Vitro to the Appropriate Antigen." Sunday morning will be devoted to symposiums on drug allergy, hay fever and food allergy. At the annual dinner at noon on Sunday the second award of the Forum's Gold Medal for "outstanding contributions to clinical allergy" will be made by Dr. William W. Duke, Kansas City, Mo. Dr. Milton B. Cohen, Cleveland, will make the presentation. Dr. Duke will deliver the annual lecture on "Beginning of Clinical Allergy in the United States." A special lecture will be given by Dr. Harry L. Alexander, professor of clinical medicine and acting head of the department, Washington University School of Medicine, St. Louis, on "Considerations of the Present Status of Clinical Allergy." The session will be concluded with a program entitled "Information on Allergy, Please," aimed to answer any questions not handled in the general program. Features of the general program will include educational exhibits and "The Picture Theater."

Symposium on Relapsing Fever.—Section N of the American Association for the Advancement of Science will devote its meeting, December 30, in the Medical Arts Building in Dallas to consideration of the "Contributions to the Study of Relapsing Fever in the Americas." Dr. Walter H. Mour-sund, Dallas, will give the historical introduction, other speakers will include:

Dr. Harry E. Wright, Texas State Department of Health, Austin, Texas, Present Distribution, Texas.
Wilton M. Fisher, M.S., instructor in bacteriology and parasitology, Baylor University College of Medicine, Dallas, Tex., Present Distribution in Oklahoma.
M. Dorothy Beck, bureau of epidemiology, state department of public health, San Francisco, Present Distribution, California.
Dr. Herbert C. Clark, director, Gorgas Memorial Laboratory, Panama, R. P., Present Distribution, Panama.
Herbert C. Johnstone, Ph.D., assistant professor of bacteriology, University of California Medical School, San Francisco, Etiology—Taxonomy.
Gordon E. Davis, Sc.D., bacteriologist, Rocky Mountain Laboratory, U. S. Public Health Service, Hamilton, Mont., Species Unity or Plurality of the Spirochete, Tick Vectors and Life Cycles of Ticks.
Malcolm H. Soule, LL.D., professor of bacteriology, University of Michigan Medical School, Ann Arbor, Mich., Cultivation of Spirochetes.
Robert A. Cooley, Sc.D., Rocky Mountain Laboratory, U. S. Public Health Service, at Hamilton, Determination of Ornithodoros Species.
Dr. Edward Francis, National Institute of Health, U. S. Public Health Service, Washington, D. C., Longevity of Fastening Ornithodoros Tunicata.
Charles M. Wheeler, Ph.D., Hooper Foundation, University of California Medical School, San Francisco, The Distribution of the Spirochetes within the Body of the Vector.
Dr. Harlin L. Wynns, state department of public health, San Francisco, Epidemiology.
Dr. George R. Magee, Yerington, Nevada, Symptomatology, Clinical Diagnosis and Therapy.
Dr. David H. Lawrence and J. L. Terrell, Austin State School, Austin, Texas, Symptomatology of Relapsing Fever Superimposed on Neurosyphilis.
Dr. Sidney W. Bohls and Vernal Irons, Sc.D., Texas State Board of Health, Austin, Laboratory Diagnosis.
Vernon T. Schulhardt, M.A., associate professor of biology, University of Texas at Austin, Serology.
Dr. Hardy A. Kemp, dean, Ohio State University College of Medicine, Columbus, Dr. Fisher and Howard L. Evans, Dallas, Texas, Pathology and Immunity.
Dr. Bohls, Public Health Aspects.

The meeting of the American Association for the Advancement of Science will open in Dallas, December 29, to continue through January 3.

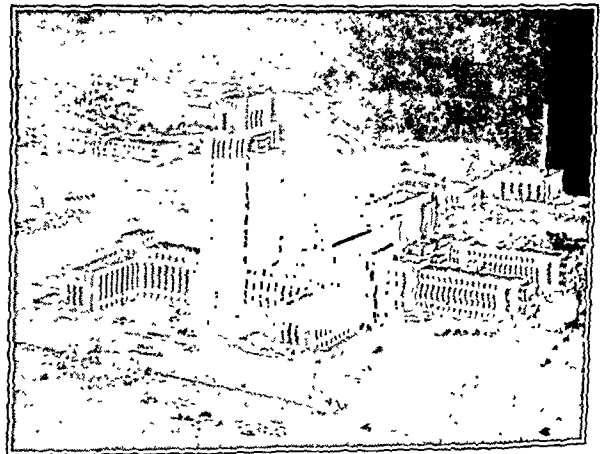
Government Services

First Aid Training by Bureau of Mines

The U. S. Bureau of Mines, Washington, D. C., during the last fiscal year gave first aid training to nearly 100,000 persons, raising the total number of persons who have received first aid certificates from the bureau of mines to more than 1,375,000. The bureau has also given instruction in the use of gas masks and in methods of handling explosions and fires in mines to about 75,000 persons. Nevertheless, in coal mines during the year there were seven major disasters with a total of 155 deaths, as compared with three major disasters and 206 deaths for the fiscal year 1940. To help reduce injuries in coal mines, the Congress of the United States passed on May 7 the Federal Mine Inspection Act, which empowers the Bureau of Mines to make inspections and investigations in coal mines. A corps of mine inspectors will be selected and laboratory facilities expanded to handle the work of investigating health and safety in coal mines.

New Naval Medical Center

The new U. S. Naval Medical Center at Bethesda, Md., which is now ready for occupancy, has been completed at a cost of \$7,000,000. It is expected that moving from present facilities in Washington, D. C., will take place after January 1. The center includes the Naval Hospital, Naval Medical School, Naval Dispensary and Naval Dental School, situated on a 247 acre reservation. The tower of the administration building, which is set on a hill facing the Rockville Pike, will be devoted to wards and individual sickrooms, is twenty stories high and rises to a height of 270 feet above the Rockville Pike. The



The new U. S. Naval Medical Center.

fourth floor of the administration building extends the full length between the wings and will house principally the x-ray department and an auxiliary surgical service. The Medical Center consists of a central group of buildings, which includes administration offices, laboratories, classrooms, a surgical pavilion, two ward buildings, ship's service, commissary and recreation facilities, including a movie theater seating six hundred. The hospital corps quarters accommodate two hundred and eighty-five men, and the nurses' quarters accommodate seventy nurses. The hospital, which has a capacity of four hundred and fifty beds, in addition to an outpatient department, will utilize the clinical laboratories of the medical school. The Naval Medical School will conduct post graduate courses in phases of medicine peculiar to naval service, such as field hygiene related to service with the marines, submarine hygiene and physiologic problems related to deep sea diving, aviation medicine and tropical diseases. The training courses conducted for hospital corpsmen of the navy will include those for x-ray, chemistry, pharmacy, clinical laboratory, epidemiologic and blood plasma technicians. The Naval Medical Center will have a medical library large enough to accommodate seventy thousand volumes and a "crew's" library for the general use and recreation of patients and staff. Special facilities have been provided for research. Special attention will be given to epidemiology and to the effects of increased and decreased air pressure having a relation to the depth to which divers may descend and the heights to which aviators may climb.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Oct. 25, 1941.

National Health Good After Two Years of War

In previous letters the satisfactory condition of national health, which has actually improved under war conditions, was stated. These reports are now confirmed by Sir Wilson Jameson, chief medical officer of the Ministry of Health, who says that at the close of the second summer of war we have every reason to be thankful for the health of the country and that there is no reason to be pessimistic about the third winter, but that every conceivable care should be exercised and local authorities and the medical profession must remain alert. Most of the infectious diseases have declined steadily. Scarlet fever and diphtheria are less prevalent than a year ago. In the first week of September the number of cases of measles was only one sixth of the number in the corresponding week of last year. Cerebrospinal fever touched its lowest level for many months in the last week of August. There are still over 3,000 cases of whooping cough a week, but not long ago the number was well over 4,000. Enteric fever, notably paratyphoid, is more prevalent than in 1940. The ministry is pushing forward with diphtheria immunization. The percentage of children immunized in different cities varies from 60 upward and in one city has reached 95. Jameson points out that it costs 15 cents to immunize a child but over \$150 to treat one for diphtheria in a hospital. There has been a rise in deaths from pulmonary tuberculosis, mostly among females of ages between 15 and 25 years. Deaths due to air raids have been least among children of school age, which is due to their evacuation to safer areas in the country. Possibly this also explains the decline of infectious diseases among them.

There is an epidemic of paratyphoid fever in Bristol, where a mobile team of the Harvard Medical Unit is working. Jameson says that if all who handle food would wash their hands before doing so these paratyphoid outbreaks would soon cease. One of the first persons to fall ill of the disease in Bristol was engaged in the preparation of food, and this was more or less responsible for the widespread outbreak. The Harvard team in Bristol consists of a medical officer, two laboratory workers, six hospital nurses and six public health nurses.

Medical Cooperation with Russia

A committee consisting of Lord Dawson, Sir Gowland Hopkins and Prof. J. A. Ryle has been formed to arrange the interchange between the British medical profession and that of the Soviet Union of the latest material on medicine. It is called the Anglo-Soviet Medical Committee. The members hold that such an interchange can be of value at present to members of the profession in both countries and that a large number of British physicians would be willing to cooperate in the work. Those interested and prepared to assist by abstracting English articles and translations of Russian work are invited to write to the committee at the house of the Royal Society of Medicine.

American Hospital in England

In the south of England is an all American complete field hospital with nine wards, a fully equipped kitchen, a pathologic laboratory and accommodation for the medical and nursing staff, consisting entirely of American volunteers. The roofs, floors, walls, every bolt and screw and all the furniture and equipment have been shipped from America as a gift from the

American Red Cross and Harvard University. The hospital is constructed of timber throughout and was delivered on the site in prefabricated sections ready for immediate assembly. It has been put together under the supervision of Mr. Gwyer, an American. It is estimated that, by employing thirty men with a knowledge of this system of construction, a hospital of this size can be assembled and equipped in less than twenty-five weeks. The hospital incorporates a mobile field unit. The director is Dr. John E. Gordon, professor of preventive medicine and epidemiology at Harvard University. The university has also supplied the whole of the medical staff.

Reduction in Civilian Air Raid Casualties

The Ministry of Home Security has published figures showing a great reduction in civilian casualties from air raids since these reached a maximum in September 1940. For August 1941 the figures were 169 killed and 136 injured and detained in hospitals. From Sept. 3, 1939 to July 31, 1940, a period before air raids on this country developed, the civilians killed numbered only 310. Then raids on a large scale began and the number killed increased considerably: in 1940 August 1,085, September 6,955, October 6,335, November 4,751, December 3,829; in 1941 January 1,539, February 793, March 4,298, April 6,068, May 5,394, June 399, July 501. The great decline since May coincides with raids on a much smaller scale, which can be explained by the attack on Russia.

BUDAPEST

(From Our Regular Correspondent)

Oct. 3, 1941.

New Law on Protection of the Magyar Race

On October 10 the new law on the protection of the Magyar race will enter into force. The law forbids marriage between Jews and non-Jews. When Christians marry and four or at least three of their grandparents are Gentiles, according to their best knowledge, no documentary evidence has to be produced at the marriage registry offices. But if only two grandparents are or were Christians, rigorous certification is demanded as to the applicants' descent. In cases of marriage in spite of the new marriage law by misleading statements the law empowers the misled party to take legal steps for the dissolution of the marriage. The law prescribes severe punishment for Jews who have sexual intercourse with native Magyar, non-Jewish woman. Henceforth persons wanting to marry must have a thorough medical examination, must be made by city medical officers of health in towns and cities and district physicians in the country. The examinations are made gratuitously, a certain fee for these being paid by the state.

The Remains of Primitive Men in the Aggtelek Cave

Aggtelek, a stalactitic cave in upper Hungary, attracted the attention of archaeologists about the middle of the nineteenth century when Christian Raisz began to examine its queer formations. In the course of his investigations, in one section of the cave which is cut into halves by the water of Acheron, in the stalactites he hit on a whole series of skeletons placed one above the other. He named this part a mausoleum. In the vicinity of the skeletons he found various kitchen utensils and decorative objects. The forms of the vases pointed to a refined taste, and the coloring and finishing to an elaborate sense of art. Raisz could not explain their presence in the cave except as a result of the Tartar invasion. His assumption was that when Batu Khan's barbarian hordes invaded the country a part of the population sought refuge in the cave. Later scientific excavations refuted Raisz's assumption. In 1876 Professor Nyáry discovered two other caves in the vicinity of the mausoleum. Fragments of tile, human skeletons, the remainders of cave dwelling bears and other animals, lances made from bear bones, spear tips, chisels, amulets, axes and saws made of fish

bones came to light. They disclosed that the cave of Aggtelek had been a human living place beginning from the stone age through the paleolith and neolith and iron age until historical times. The seeds of wheat, lentil, rye, barley and the remainders of fourteen animals corroborate the assumption that the inhabitants of the cave knew agriculture and the breeding of useful animals. Examination of the skeletons revealed that they originated from primitive Magyars and by scientific comparison they could be strictly delineated from skeletons originated from the invading Mongolians and Tartars. Many of the skeletons are on exhibit at the Ethnographical Museum in Budapest.

Tolerance of Young Cats for Chloroform

Katona and Besenyei studied chloroform narcosis on young cats of different ages. They observed that the blood pressure of grown up animals falls at the outset of narcosis, while that of young animals during the course of narcosis does not change much. In young animals periodic fluctuation of blood pressure is frequent in conjunction with partial respiratory paralysis about the end of narcosis. This phenomenon was observed by them also on grown up animals. The pulse rate of adult animals gradually decreases from the beginning of narcosis, while that of young animals decreases only after a transitory rise, and in deep narcosis it rises again. The respiration of adult animals is accelerated during the whole course of the narcosis; young animals breathe rapidly, but in deep narcosis the rate of respiration falls below normal. Partial respiratory paralysis with periodic respiration is of frequent occurrence: this is never observed on adult animals. The cause of death of adult animals from narcosis frequently is syncope. Katona and Besenyei believe that for the purposes of surgical narcosis chloroform is safer in the developing age than in adults but that does not mean it is so toxic as to justify its disuse in cases in which ether is contraindicated.

Formula for Estimation of Increase of Length and Weight of Infants

Dr. Joseph Lukács has compiled formulas with which one can easily calculate normal length and weight data. 1. The normal body weight of an infant is obtained by multiplying the age in months by 600 and adding this sum to its birth weight. If the latter is unknown, an average of 3,300 Gm. is taken. For instance, a 5 months old infant with a birth weight of 3,100 Gm. should weigh $5 \times 600 + 3,100 = 6,100$ Gm. The body weight of children between 1 and 12 years of age is obtained by subtracting 1 from the number of years, multiplying the remainder by 2 and adding 10. For instance, the weight of a child of 9 years is $9 - 1 = 8 \times 2 + 10 = 26$ Kg. These formulas give average figures. The weight of girls is slightly less than that of boys, so that if the formula is applied for girls the value obtained should be taken as optimal, while for boys it is minimal. 2. The normal height of an infant is obtained by multiplying its age in months by 2 and adding 52 to the sum obtained. Thus the length of an 8 months old infant is $8 \times 2 + 52 = 68$ cm. The height of a child of 2 to 4 years is obtained by multiplying the age in years by 10 and adding 60 to the sum. For instance, the normal height of a 3 year old child is $3 \times 10 + 60 = 90$ cm. The height of children between 5 and 14 is reckoned by multiplying the age in years by 5 and adding 80 to the sum. For instance, the height of a child of 6 is $6 \times 5 + 80 = 110$. In regard to the body length, the difference between boys and girls is negligible.

New Institution for Research on Nutrition

The Ministry of Internal Affairs has established a new institute for research in proper feeding. The institute, which is in Budapest, will be opened in the next few days. The building and equipment are modern and will accommodate two hundred country doctors, who will attend courses in the science of feeding. The staff of the institute comprises clinicians, chemical experts, economists and financial experts.

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct. 11, 1941.

Brazilian and American Congress of Surgery

The third Brazilian and American Congress of Surgery, organized by the Brazilian College of Surgeons, will be held November 16-20 at Rio de Janeiro. The official subjects will be "Surgery of Pain," "Burns" and "Amputations from the Functional Point of View." This congress will draw to Rio de Janeiro many important surgeons from North and South America. Among the foreign surgeons will be Prof. Julio Diez of Buenos Aires, Argentina, and Prof. Manuel Riveros of Assuncion, Paraguay, who are official translators for the congress. The president will be Prof. Benedito Montenegro of the University of São Paulo.

Pulmonary Schistosomiasis (Mansoni)

A clinical study of pulmonary schistosomiasis (mansoni) has been made by Dr. João Alves Meira, assistant of the Faculty of Medicine of São Paulo and a specialist on tropical diseases. The 4 cases described show that there is a pulmonary form of schistosomiasis (mansoni). In some cases the diagnosis can be made only by examination of the sputum, by roentgenograms and by a therapeutic test. The pulmonary forms occur especially in patients who have visceral schistosomiasis of advanced degree.

The roentgen evidence of the pulmonary forms alone cannot be accepted, for confirmation by other data, such as the presence of the parasite's eggs in the sputum, is required. Eosinophilia may be transitory, but its presence is important.

The prognosis varies with the clinical form of the disease. The most serious manifestations are those caused by endarteritis complicated by cardiac insufficiency. When pulmonary aspects occur in advanced cases of the disease with a picture of hepatic cirrhosis and splenomegaly, the prognosis is generally grave.

Marriages

KENNETH L. MCGUIRE, Richland, Iowa, to Miss Alta Patricia McDEVITT of Spokane, Wash., in Fairfield, Iowa, October 9.

WILLIAM BEDWELL HARRELL JR., Little Rock, Ark., to Miss Erin Johnson Wallace of Birmingham, Ala., in October.

WALTER JOSEPH DUKSA, Hartford, Conn., to Miss Anna Emily Lennon of Washington, D. C., September 20.

FRANK TRESSLER LINZ to Miss Josephine Gwaltney McGowan, both of Tampa, Fla., October 24.

WILLIAM ALFRED MITCHELL, Newport News, Va., to Miss Ella Walker Hill in Roanoke, November 8.

CORNELIUS P. MURPHY, Alton, Iowa, to Miss Ethel Koelzer of LeMars, at Jordan, Minn., September 15.

WILLIAM PLEAS STONER, Memphis, Tenn., to Miss Edna May Wilson of Guston, Ky., in October.

OLIVE ANGA LUNDGREN, Minneapolis, to Mr. James Gordon Bateman of Great Falls, Mont., June 24.

JOSEPH ARCHER RAVENEL, Charleston, S. C., to Miss Mary Castrinos of New Orleans, November 5.

WILLIAM FRANCIS JACOBS to Miss Mary Margaret Haskins, both of Chicago, in October.

WILLIAM HIGGINSON to Miss Louise W. Sona, both of Nashville, Tenn., in October.

HANNS C. SCHWYZER, St. Paul, to Miss Margaret Nelsen of Minneapolis, October 18.

DERBERT MERENLOOM, Cumberland, Ky., to Miss Nancy Ettin of Harlan in October.

JOHN THOMAS AKIN JR. to Miss Ladye Jane Akin, both of Atlanta, Ga., October 11.

JOSEPH E. PISETSKY, Brooklyn, to Miss Lillian Sax of New York, August 17.

HARRY GIBEL to Miss Pearl Charms, both of Brooklyn, October 19.

Deaths

Kenneth Daniel Blackfan * Boston; Albany (N. Y.) Medical College, 1905; Thomas Morgan Rotch professor of pediatrics at Harvard Medical School and the graduate school; professor of pediatrics at the University of Cincinnati College of Medicine from 1920 to 1923; instructor in pediatrics from 1913 to 1917, associate from 1917 to 1919, and associate professor at Johns Hopkins University School of Medicine, Baltimore, 1919-1920, and lecturer in clinical pediatrics, 1920-1921; assistant at Washington University School of Medicine, St. Louis, 1911-1912; member and past president of the American Pediatric Society; member of the American Academy of Pediatrics, the New England Pediatric Society, Association of American Physicians and the American Society for Clinical Investigation; member of the Harvard Infantile Paralysis Commission; delegate, White House Conference on Child Health and Protection in 1930 and editor of the report in 1932; general secretary of the Fifth International Commission on Nutrition sponsored by the League of Nations in Berlin in 1932; was general secretary of the International Congress of Pediatrics; chairman of the General Advisory Committee on Maternal and Child Welfare under the Social Security Act, from 1935 to 1937; consultant of the Children's Bureau since 1935; member of the Commission on Graduate Medical Education since 1937; honorary member of the Philadelphia Pediatric Society; corresponding member of the Royal Society of Medicine of England (section of the study of disease in children) and the British Pediatric Association; member of the Council on Pharmacy and Chemistry of the American Medical Association from 1934 to 1935; member of the board of directors of the Infants' Hospital; aged 58; died, November 29, at Louisville, Ky., of a malignant tumor of the brain.

Frederick Taylor Lord * Boston; Harvard Medical School, Boston, 1900; assistant in clinical medicine from 1905 to 1909, instructor from 1909 to 1930, clinical professor of medicine from 1930 to 1935 at his alma mater and since 1935 clinical professor of medicine emeritus; past president of the American Association for Thoracic Surgery; formerly vice president of the National Tuberculosis Association; president of the Massachusetts Tuberculosis League; member of the Association of American Physicians; fellow of the American College of Physicians; member of the American Society for Clinical Investigation and the American Clinical and Climatological Association; in 1917 member of the American Red Cross Commission to Serbia; served as visiting physician from 1912 to 1935 and member of the board of consultation since 1935 and in various other capacities at the Massachusetts General Hospital; served as a member of the advisory committees of the state department of public health and the city health department; member of the Boston Council of Social Agencies and chairman of the pneumonia and tuberculosis committees, Boston Health League; author of "Diseases of the Bronchi, Lungs and Pleura" and "Pneumonia"; co-author, with Dr. Roderick Heffron, of "Lobar Pneumonia and Serum Therapy," and "Pneumonia and Serum Therapy" and co-author, with Dr. Elliott S. Robinson and Dr. Heffron, of "Chemotherapy and Serum Therapy of Pneumonia"; aged 66; died, November 4, in the Baker Memorial of the Massachusetts General Hospital of subarachnoid hemorrhage.

James Porter Fiske, New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1891; surgeon, Charity Hospital and New York Maternity Hospital, 1891-1892; obstetric surgeon, Church Hospital, and attending surgeon, St. Elizabeth's Hospital, since 1893; orthopedic surgeon, New York Post-Graduate Hospital, from 1895 to 1899; orthopedic surgeon, Roosevelt Hospital, from 1893 to 1901; assistant surgeon, Bellevue Hospital, 1899-1900; orthopedic surgeon, New York Hospital; a founder of the schools for crippled children; past president of the Guild for Crippled Children of the Poor of New York; attending surgeon, Free School for Crippled Children from 1901 to 1913; charter member of the W. H. Davis School for Crippled Children; manager of the New York State Hospital for Crippled and Deformed Children; served during the World War; in 1924 was made a lieutenant colonel in the medical officers reserve corps; aged 74; was killed, October 25, in an automobile accident, near Commerce, Okla.

Menas Sarkas Gregory * New York; Albany (N. Y.) Medical College, New York, 1898; professor of psychiatry, University and Bellevue Hospital Medical College, now known as the New York University College of Medicine, from 1922 to 1936 and since 1936 emeritus professor; formerly professor

of psychiatry, New York Post-Graduate Medical School; member of the American Neurological Association, American Psychiatric Association and the Association for Research in Nervous and Mental Diseases; director of the psychiatric division, Bellevue Hospital, from 1904 to 1934 and since 1936 consultant; served during the World War; aged 69; died, November 2, while playing golf at Tuckahoe, N. Y.

Jack Schluger, Dayton, Ohio; Long Island College of Medicine, Brooklyn, 1936; was commissioned as a first lieutenant, medical corps reserve on June 2, 1936; served as a Civilian Conservation Corps camp surgeon in the Third Corps Area from June 15, 1936 to Jan. 4, 1937, and Oct. 25, 1938 to Sept. 30, 1939; was ordered to extended active duty with the United States Army, effective Aug. 1, 1941 and assigned to Kelly Field, Texas; on the staff of the Veterans Administration Facility, National Military Home; aged 32; was killed, October 14, in an airplane accident ten miles from Greensburg, Pa.

Grant Fletcher Mollring * assistant surgeon, lieutenant, junior grade, United States Navy, Great Lakes, Ill.; University of Nebraska College of Medicine, Omaha, 1936; was appointed assistant surgeon in the medical corps of the United States Navy on Oct. 25, 1940; formerly served with the 10th Provisional Company of the United States Marine Corps at Quantico, Va., and also for a time at one of the new Atlantic bases; at one time surgical assistant at the Parkview Hospital, Rocky Mount, N. C.; aged 27; died, October 27, at the United States Naval Hospital, of acute anterior poliomyelitis.

Cary Robert Pollock, Denver; Vanderbilt University School of Medicine, Nashville, Tenn., 1915; member of the Colorado State Medical Society; was assigned to active duty Oct. 14, 1916 as a first lieutenant medical reserve for a course of instruction at the Army Medical School, Washington, D. C.; commissioned first lieutenant in the regular army medical corps March 28, 1917; promoted to major, March 28, 1918; resigned from the service Jan. 31, 1927; fellow of the American College of Surgeons; on the staff of the Presbyterian Hospital; aged 53; died, October 25.

Seth Selig * New York; Columbia University College of Physicians and Surgeons, New York, 1921; member of the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; medical officer of the city fire department; attended on the Mount Sinai Hospital and the for Chronic Diseases; consulting orthoped hospital, Blythedale Convalescent Home and the New York Jewish Guild for the Blind; aged 44; died, November 2, of coronary sclerosis.

Melville Black * Denver; Bellevue Hospital Medical College, New York, 1889; professor of ophthalmology emeritus at the University of Colorado School of Medicine; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past president and secretary of the Colorado State Medical Society; ophthalmologist, St. Luke's Hospital, Children's Hospital and the Colorado General Hospital; aged 75; died, November 12, in St. Joseph's Hospital of bronchopneumonia and pyelonephritis.

Max Talmey, New York; Ludwig-Maximilians-Universität Medizinische Fakultät, München, Bavaria, Germany, 1894; member of the Medical Society of the State of New York; chief ophthalmologist and aurist at the Yorkville Hospital, now the Beth David Hospital from 1902 to 1908; surgeon at Harlem Eye, Ear and Throat Infirmary from 1905 to 1917; author of a book entitled "The Relativity Theory Simplified"; aged 74; died, November 6, of chronic myocarditis.

George Ambrus * New York; Magyar Királyi Ferencz József Tudományegyetem Orvostudományi Kara, Szeged, Hungary, 1922; formerly assistant professor of pathology at the University of Hungary; director of the New York Physicians and Diagnostic Laboratory; aged 45; died, November 14, in the New York Post Graduate Hospital of carcinoma of the jejunum and abdominal metastasis.

William N. Beggs, Denver; St. Louis Medical College, 1886; member of the Colorado State Medical Society; medical director of Sands Home, Edgewater; on the staff of the Jewish Consumptive Relief Society Sanatorium; aged 79; emeritus member of the staff of the Swedish National Sanatorium, Englewood, Colo., where he died, October 31, of myocarditis and arteriosclerosis.

William Kay Bartlett * Colonel, United States Army, retired, San Francisco; Medico-Chirurgical College of Philadelphia, 1903; entered the medical corps of the United States Army as an assistant surgeon in 1907; served during the World

War; was promoted to the grade of colonel in 1933 and retired in 1935 for disability in line of duty; aged 63; died, November 2.

Thomas Francis Birmingham * Galesburg, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1904; member of the American Urological Association; president-elect of the Knox County Medical Society; aged 58; on the staffs of the Galesburg Cottage Hospital and St. Mary's Hospital, where he died, November 1, of cirrhosis of the liver.

Guy Payne Sanderson, Vicksburg, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1923; member of the Mississippi State Medical Association and the Southeastern Surgical Congress; served during the World War; served the Vicksburg Hospital in various capacities; aged 43; died, October 30, of acute coronary occlusion.

Willard Richardson Pierce, Milford, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1909; served during the World War; formerly member of the state legislature; member of the state board of health; on the staff of the Milford Memorial Hospital; aged 55; died, October 30, of myocardial degeneration.

Marion Albert Andreen * Chicago; Northwestern University Medical School, Chicago, 1922; associate in otolaryngology at his alma mater; member of the American Board of Otolaryngology; aged 47; died, November 10, at the South Shore Hospital of carcinoma of the gallbladder and cerebral thrombosis.

Chauncey De Witt Beebe * Sparta, Wis.; Northwestern University Medical School, Chicago, 1918; was president of the Seventh District Medical Society; for many years president of the school board of Sparta; on the staff of St. Mary's Hospital; aged 49; died, November 5, of heart disease.

James David McCord, Lynchburg, Tenn.; University of Nashville (Tenn.) Medical Department, 1909; member of the Tennessee State Medical Association; county health officer; medical director and owner of a hospital bearing his name; aged 59; died, October 31, of coronary thrombosis.

Homer Daniel McGill, Clarksburg, Tenn.; Nashville (Tenn.) Medical College, 1878; member of the Tennessee State Medical Association; past president of the Carroll County Medical Society; aged 84; died, October 30, of uremia and prostatic obstruction.

Wallace Henry Carver, Los Angeles; Colorado School of Medicine, Boulder, 1902; served during the World War; aged 66; died, October 5, in the Veterans Administration Facility, West Los Angeles, of bronchopneumonia, arteriosclerosis and nephrosclerosis.

Thomas Hudson Harter, Pasadena, Calif.; University of Pittsburgh School of Medicine, 1914; member of the California Medical Association; served during the World War; chief surgeon, City of Pasadena Emergency Hospital; aged 51; died, October 20.

Emery Wells Goemmel * Rockford, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 60; on the staff of St. Anthony's Hospital, where he died, November 1, of coronary thrombosis.

Lucia Florence Vickery, Boston; Woman's Medical College of the New York Infirmary for Women and Children, New York, 1892; member of the Massachusetts Medical Society; aged 81; died, October 23, of carcinoma of the pancreas.

Benjamin B. Tout, Archie, Mo.; Columbian Medical College, Kansas City, 1901; member of the Missouri State Medical Association; formerly state senator; bank president; at one time postmaster; aged 74; died, October 29, of paralysis agitans.

Adolf M. Silten, New York; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1901; member of the Medical Society of the State of New York; on the staff of the Beth David Hospital; aged 63; died, November 3.

Edward Vincent Murphy, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1914; formerly medical superintendent of the Alexandra Hospital; aged 56; died, October 26, in the Royal Victoria Hospital.

Atherton Perry Mason, Fitchburg, Mass.; Harvard Medical School, Boston, 1882; member of the Massachusetts Medical Society; formerly city bacteriologist; at one time member of the board of health; aged 85; died, October 20.

Herman Henry Moore, Markham, Va.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1908; Detroit College of Medicine, 1909; fellow of the American College of Surgeons; aged 61; died, October 20.

Charles J. Forney, Woodward, Okla.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1901; member of the Oklahoma State Medical Association; aged 71; died, October 23, in Shattuck of arteriosclerosis.

Blanche Horner Muldoon Bach, Pico, Calif.; Indiana University School of Medicine, Indianapolis, 1910; member of the Medical Society of the State of Pennsylvania; at one time school physician; aged 53; died, September 20.

Elbert Stevenson Dupuy * Beckley, W. Va.; Miami Medical College, Cincinnati, 1901; formerly secretary of the Raleigh County Medical Society; for many years on the staff of the Beckley Hospital; aged 65; died, October 16.

Hugh Boleyn Sprague * Salt Lake City, Utah; Jefferson Medical College of Philadelphia, 1905; served during the World War; formerly police surgeon and assistant city health commissioner; aged 63; died, October 11.

William Rufus King Beck, Jackson, Miss.; Birmingham Medical College, 1914; member of the Mississippi State Medical Association; served during the World War; aged 56; died, November 15, of coronary thrombosis.

William Roderick Dunbar, Truro, N. S., Canada; McGill University Faculty of Medicine, Montreal, Que., 1897; past president of the Nova Scotia Medical Society; aged 71; died, September 12, in New Glasgow.

Walter Oscar Bartlett * Boston; Harvard Medical School, Boston, 1902; aged 62; died, November 5, in the Baker Memorial of the Massachusetts General Hospital of embolism of the right internal carotid artery.

Stonewall Jackson Emory, Navasota, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1893; past president of the Grimes County Medical Society; aged 69; died, October 17.

John W. Bolen, Galax, Va.; Medical College of Virginia, Richmond, 1885; member of the Medical Society of Virginia; aged 80; died, November 2, in St. Albans Sanatorium, Radford, of coronary sclerosis.

Louis Charles Barrette, Sacramento, Calif.; Washington University School of Medicine, St. Louis, 1925; member of the California Medical Association; aged 43; died, November 15, of malignant hypertension.

Margaret Coy-Bryan, Columbus, Ohio; Woman's Medical College of Pennsylvania, Philadelphia, 1934; member of the Ohio State Medical Association; aged 31; died, October 11, in the White Cross Hospital.

Charles Chessher Foster * Granger, Texas; Medical Department of Tulane University of Louisiana, New Orleans, 1893; past president of the Williamson County Medical Society; aged 72; died, October 3.

Frederick Clarence Clarke, Bridgetown, Barbados, British West Indies; McGill University Faculty of Medicine, Montreal, Que., 1908; served during the World War; aged 58; died, September 20.

Chester Cole Ames * Detroit; Detroit College of Medicine and Surgery, 1926; on the staff of the Receiving Hospital, Parkside Hospital and the Trinity Hospital; aged 43; died, November 2.

Frederick Cornelius Macdonald, Boston; Tufts College Medical School, Boston, 1901; member of the Massachusetts Medical Society; aged 65; died, October 27, of coronary thrombosis.

Edward Oliver Bonsteel, Cleveland; Cleveland Homeopathic Medical College, 1903; served during the World War; aged 73; died, November 5, of ruptured aneurysm of the abdominal aorta.

Goldburn H. Wilson, St. Louis; St. Louis College of Physicians and Surgeons, 1889; formerly member of the state legislature; aged 76; died, October 31, of coronary sclerosis.

Emile Roy, Tulsa, Okla.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1901; member of the Oklahoma State Medical Association; aged 78; died, October 13.

Lemuel Martin Roberts, Little Falls, Minn.; Hahnemann Medical College of Philadelphia, 1883; member of the Minnesota State Medical Association; aged 79; died, October 9.

Olaf Magnuson Sattre, Rice Lake, Wis.; Rush Medical College, Chicago, 1888; member of the State Medical Society of Wisconsin; bank president; aged 78; died, October 27.

James H. Guinn, Wilmington, Calif.; Kansas City (Mo.) Medical College, 1886; aged 85; died in July at Los Angeles of arteriosclerosis.

George E. Gwinn, San Antonio, Texas; Barnes Medical College, St. Louis, 1898; died in September.

Correspondence

INTERNATIONAL SOCIETY OF SURGERY

To the Editor:—The opportunity for gathering together a number of the fellows of the International Society of Surgery was presented by their attendance at the recent clinical congress of the American College of Surgeons in Boston, November 3-7.

The minutes of the meeting of certain American, Canadian and South American fellows of the International Society of Surgery at the Harvard Club of Boston, November 6, are as follows (forty-six fellows attended):

A report was given of the inaccessibility of the executive staff of the society following the collapse of France and Belgium. It was pointed out that the president, Dr. Mayer, the secretary general, Dr. Dejardin, and the treasurer, Dr. Lorthioir, were all Belgians and that we had not been able to get in touch with them since the occupation of Belgium.

It was pointed out that the National Committee for the United States and Canada, though it had no desire to continue in office, believed that the International Society of Surgery, the first and for nearly half a century the leading and most authorized exponent of surgical culture and achievement throughout the civilized world, was a necessary part of international medical relations and that temporarily the responsibility for continuing the existence of this society rested on the fellows in the Western Hemisphere.

In conformity with this feeling the committee presented certain resolutions for action by those present in order that the activities of the International Society of Surgery might be continued and fostered during the period of the present war.

The following resolutions were voted on and passed:

1. *Resolved*, That we, Fellows of the International Society of Surgery, here assembled in response to the call of the National Committee for the United States and Canada in Boston, Massachusetts, and coincidentally with the thirty-first Clinical Congress of the American College of Surgeons and in the absence, or lack, of all possible communication with the Executive Bureau at Brussels, do name, elect, and authorize the National Committee of the American Section, consisting of Elliott C. Cutler, M.D., Boston, Massachusetts, Rudolph Matas, M.D., New Orleans, Louisiana, and Eugene H. Pool, M.D., New York, New York, to take appropriate steps to continue their duties and functions until such time as the restoration of peace and order in Europe, and particularly in Belgium, will permit the International Society of Surgery to resume its normal prewar mode of existence.

2. *Resolved*, That the National Committee of the International Society of Surgery in the United States be likewise authorized to enlarge its own committee membership in any way that it may deem necessary to meet the requirements of the Committee and of the Society.

3. *Resolved*, That the National Committee shall be authorized by consultation and correspondence with Western Hemisphere colleagues to perfect further organization.

It was clear that some of the fellows did not feel that the American group had the authority to take over the executive duties of the central organization but felt that it was desirable for all fellows in the Western Hemisphere to join together in continuing the society by an enlargement of the present National Committee for the United States and Canada and by adding to the roster suitable members from all parts of the Western Hemisphere after consultation with the surgical academies and societies now existent. In particular the fellows from Venezuela, Argentina, Brazil and Cuba voiced the opinion that they and their colleagues from Central and South America would be glad to be consulted and to further this activity.

NATIONAL COMMITTEE FOR THE UNITED STATES AND CANADA.

ELLIOTT C. CUTLER, M.D., Boston, Chairman.
RUDOLPH MATAS, M.D., New Orleans.
EUGENE H. POOL, M.D., New York.

POTENCY OF DIGITALIS PREPARATIONS

To the Editor:—In THE JOURNAL, October 11, page 1243, appeared an article calling attention to the increase in potency of the digitalis preparations in the U. S. Pharmacopeia XI, which became official June 1, 1936 (Bland, E. F., and White, Paul D.: The Strength of Digitalis in Clinical Use: A Warning). Unfortunately, not enough publicity was given to the change at the time when it took effect. Further, there has been some controversy as to just what the change was. This communication is written to present the intent of those responsible for the next revision of the U. S. Pharmacopeia.

The change in potency made at the time of the last revision was intended to bring the digitalis preparations of the U. S. Pharmacopeia XI into line with those of countries accepting the League of Nations Standards. In the U. S. Pharmacopeia XI (p. 136) appears the following statement regarding the unit in which the activity of digitalis preparations is to be expressed: "One United States Pharmacopeial Digitalis Unit is identical in potency with the International Digitalis Unit, as adopted in 1928 by the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations. One International Digitalis Unit represents the activity of 0.1 Gm. of the International Standard Digitalis Powder." Powdered Digitalis of the U. S. Pharmacopeia XI is required to possess a potency of 10 U. S. P. units per gram and Tincture of Digitalis 1 U. S. P. unit per cubic centimeter. When these requirements were established it was generally believed that meeting them involved an increase in potency to 125 to 130 per cent of those official in the U. S. Pharmacopeia X (Edmunds, C. W.: The Potency of Digitalis Preparations of the 1936 Pharmacopeia, THE JOURNAL, July 22, 1939, p. 284).

The preparation of digitalis which was to serve as the new U. S. Pharmacopeia XI standard was prepared under the auspices of the Committee of Revision and then assayed against the 1926 International Standard Digitalis. When so examined it was found to be definitely stronger than the International Standard. When compared by the official one hour frog method in the laboratory of the chairman of the Subcommittee on Biological Assays, the late Dr. C. W. Edmunds, it was found that 0.745 Gm. of the United States Powder was equal in activity to 1.000 Gm. of the International Powder. This result did not create difficulty. It simply meant that 1 Gm. of the Pharmacopeial preparation Powdered Digitalis had to be equivalent in activity to 0.745 Gm. of the U. S. P. Reference Digitalis Powder instead of to 1.0 Gm.

However, there has not been universal acceptance of the correctness of this value of 0.745. Those who disagreed with Dr. Edmunds believed the Reference Digitalis Powder to be even stronger than he found it, which is another way of saying that his factor was too large. If this is true, then any digitalis preparation assayed against the U. S. P. XI Reference Digitalis Powder using this factor and meeting the Pharmacopeial requirement would actually be more than 130 per cent of the U. S. Pharmacopeia X strength. In the article by Bland and White which evoked this communication, the statement is made that "the majority of pharmacologists agree that by biological assay this increase in potency is approximately 25 to 30 per cent." I cannot speak for the majority of the pharmacologists, but most of the published biologic assay results indicate that the increase is something over 50 per cent, which brings the findings into line with those reported for clinical strength by Bland and White.

In 1939, because of a general feeling that the method of assay could be improved, a collaborative study was organized under the auspices of the U. S. P. XI of the assay of digitalis using frogs. At the request of the chairman of the U. S. P. XI Revision Committee, Prof. E. Fullerton Cook, and with the approval of Dr. Edmunds, chairman of the Subcommittee on Biological Assays, I have acted as chairman of this study. Gen-

erous collaboration has been received from university and manufacturing laboratories and the government control laboratories in both Canada and the United States. Studies by members of the group have confirmed the view that the present U. S. P. Reference Digitalis Powder is stronger than was intended.

Because of this fact, and also because of other characteristics which make the Reference Digitalis Powder unique, a new so-called "Study Powder" was prepared through the office of the chairman of the Revision Committee. This powder, a composite of assayed digitalis from a variety of sources, has now been extensively examined by several methods in a number of laboratories, and its characteristics are well known. The adoption of this powder as the standard of reference has been recommended to the Subcommittee on Biological Assays of the U. S. P. XII. The recommendation has been accepted, and when the powder has been adjusted to the potency of the International Standard, i.e., so that it contains 10 international units per gram, it is to become the Reference Digitalis Powder of the U. S. P. XII. The activity of all pharmacopeial digitalis preparations will continue to be expressed in terms of "Digitalis Units." One U. S. P. XII Digitalis Unit is to be the activity of 0.100 Gm. of this new Reference Digitalis Powder. Further, the comparison is to be made by the use of cats rather than frogs as the assay animal.

In the light of this explanation, qualification must be made of the statement by Drs. Bland and White, in footnote 6 of their paper, that in the twelfth revision of the U. S. Pharmacopeia the unit of potency has not been altered. The essential wording has perhaps not been seriously modified, although the U. S. P. XII will make it clear that the U. S. P. XII Reference Digitalis Powder is the reference standard, and that the published relationship to the International Standard is for purposes of information and not of definition. But the strength of the standard has been altered, and a new method of assay has been prescribed. These do in fact alter the unit.

The sole concern of the physician, however, is with the effect of these changes on the potency of official digitalis preparations. Practically all of the intensive studies of digitalis dosage were made prior to 1936, when the U. S. P. XI standards became effective. Most of the recent discussions have centered around the relationship of the U. S. P. XI digitalis potency to that of the digitalis in use prior to that time. How much stronger are present day preparations? What is to be the relative potency of the new preparations?

An answer to either of these questions presupposes a satisfactory knowledge of the strength of the earlier preparations. Exact information satisfactory to the biologic assayist is wanting on this point. However, there is adequate information on which to base a statement that should be satisfactory for those using digitalis in the clinic.

The U. S. P. XI Revision Committee intended to bring the official preparations of digitalis into conformity with international practice, which would have increased them to about 125-130 per cent of those previously official in the Tenth Revision. Actually those preparations which were adjusted to the new requirement have been found to be stronger than intended, running as high as 150 per cent. The U. S. P. XII preparations are to have the potency intended in the U. S. P. XI, namely about 125 per cent of those in use before 1936.

The implications of this statement should be emphasized. Official digitalis preparations of the U. S. P. XII will be somewhat weaker than those now current but will continue to be stronger than those of the period before 1936. This increase in potency must be recognized. The Revision Committee of the U. S. P. XII hopes that with the adoption of a new standard of reference, with a new method of standardization and with the greatly increased knowledge of biologic assays that has grown in part from attempts at solution of the controversial issues, this confusion may be cleared away. However, unless it is clearly

understood that there has been an increase in the potency of digitalis preparations official since 1936, this confusion will continue.

Digitalis preparations official under the U. S. P. XI, effective since June 1, 1936, are stronger than those of the U. S. P. X. Adoption of the proposed U. S. P. XII Reference Digitalis Powder and definition of the U. S. P. XII Digitalis Unit as the activity of 0.100 Gm. of this powder will result in a continuation of this increase in potency. Digitalis preparations official in the U. S. P. XII will have a potency equal to about 125 per cent of those in use prior to 1936. Since most clinical studies of digitalis dosage on which present practices are based were made before 1936, it is important that the medical profession recognize that both current digitalis preparations and those to be official in the forthcoming Twelfth Revision of the U. S. Pharmacopeia are stronger than those of the U. S. Pharmacopeia X.

ERWIN E. NELSON, M.D.,

Department of Pharmacology, Tulane University of Louisiana School of Medicine,
New Orleans.

Chairman, Subcommittee on Biological Assays,
U. S. P. XII Revision Committee.

TRANSFUSION OF BLOOD AND BLOOD SUBSTITUTES

To the Editor:—The concluding paragraph of the editorial "Transfusion of Blood and Blood Substitutes" (*THE JOURNAL*, November 8, p. 1627) contains the statement "The dried plasma promises to be the eventual solution of the problem for war emergency because of the greater stability, smaller bulk and the relative simplicity of packing, storing and transporting." This seems to me to be an oversimplification of the problem. The experimental and clinical studies in Great Britain and in this country have proved conclusively the efficacy of transfusions of plasma and serum in the first aid treatment of shock. Even shock accompanying hemorrhage can be treated successfully by restitution of the blood volume with serum or plasma, provided the bleeding is controlled. The personnel of the British Army Blood Supply Depot under the command of Col. L. E. H. Whitby has had a rare opportunity to study the treatment of shock in air raid casualties (Kekwick, A.; Maycock, W. D.; Marriott, H. L., and Whitby, L. E. H.: *Diagnosis and Treatment of Secondary Shock: A Study of Twenty-Four Cases*, *Lancet* 1:99 [Jan. 25] 1941). They found that from 2 to 6 pints (1 to 3 liters) of citrated plasma was required for the adequate treatment of shock accompanying hemorrhage. But they expressed the opinion that 1 of every 3 pints of fluid administered should consist of whole blood when large amounts of plasma were required. This was advised to obviate the further dilution of the recipient's erythrocytes and is supported by the experience of Scudder and Self (*Controlled Administration of Fluid in Surgery*, *New England J. Med.* 225:679 [Oct. 30] 1941).

But when death from shock has been averted by this treatment, the patient frequently faces the hazard of an urgent major surgical operation under general anesthesia. With the widespread use of blood transfusions in this country in recent years the opinion has been formed that patients with posthemorrhagic anemia tolerate operations much better if the oxygen carrying capacity of the blood is enhanced by the transfusion of erythrocytes. Blalock has stated that "every effort should be made to restore the red blood cell count and the blood volume to normal prior to operation" (*Principles of Surgical Care*, St. Louis, C. V. Mosby Company, 1940, p. 148). In large civilian general hospitals in this country about two thirds of all whole blood transfusions are administered to surgical patients. The indication for most of these transfusions is the correction of anemia before operation. Undoubtedly the same indication will prove

as frequent in military medicine. Plasma will not be suitable for this phase of the war emergency.

The recent development of blood substitutes for use in military medicine has resulted in much confusion for civilian practitioners. In warfare the ease of storage, transportation and administration of such products is a much more potent argument in their favor than it is in civilian practice, in which the facilities for laboratory procedures and refrigeration are adequate or easy to obtain. For the civilian hospital, methods are readily available for the manufacture from preserved whole blood of liquid plasma stored either at room temperature or in the refrigerator. The production and storage of frozen plasma is also feasible. Conclusive evidence has not been introduced to discredit any of these products.

In three places in the editorial are references to the fact that the use of plasma or serum obviates the necessity of typing and cross matching of bloods. Here again the argument which correctly carries great weight in military medicine has actually only slight application to civilian practice. Many physicians are impressed by the argument of the saving of time in an emergency because the laboratories on which they rely are employing time consuming methods for the typing and cross matching of blood. When the centrifugation technic of Landsteiner is used it is possible to type or cross match blood accurately in five minutes. By utilizing a blood bank in the University Hospitals of the State University of Iowa it has been possible to have whole blood running into the recipient's vein within fifteen minutes after the demand for a transfusion is made. During the interval mentioned, the recipient's blood group is determined and his serum and cells cross matched with those of an appropriate specimen in the refrigerator. Rabbit antiserum, now commercially available, indicates the group of the erythrocytes thirty seconds after it is mixed with the cell suspension. Preserved blood of group O can be administered to any recipient in an emergency without preliminary typing of the recipient or cross matching of the bloods. The addition of the recently developed A and B substances to the blood of group O neutralizes the agglutinins in the plasma and promises to obviate most of the objections to the employment of universal donor blood (Witebsky, Ernest; Klendshoj, N. C., and Swanson, Paul: Preparation and Transfusion of Safe Universal Blood, *THE JOURNAL*, June 14, p. 2654).

A consideration of civilian practices in the transfusion of plasma and whole blood is not entirely foreign to the war emergency. In this time of "total war," in which civilian casualties may be numerous, sources of readily available whole blood and plasma are extremely valuable to the community. They may serve as depots from which the military forces may draw. In times of peace there are myriad examples in which small community hospitals have suddenly been faced with the task of treating scores of victims of a railway wreck, an earthquake, a hotel fire or multiple automobile accidents. The presence of a blood and plasma bank may appreciably affect the mortality resulting from such disasters.

The development of methods by which whole blood can be preserved for thirty days in a refrigerator in a modified Rous-Turner dextrose-citrate mixture (DeGowin, E. L.; Harris, J. E., and Plass, E. D.: Studies on Preserved Human Blood: I. Various Factors Influencing Hemolysis, *THE JOURNAL*, March 9, p. 850) has made possible the operation of blood banks on a much smaller scale than is feasible when the time of preservation is shorter. At the expiration of the limit of storage the dilute dextrose-citrate plasma may be aspirated from the erythrocyte layer with a minimum of equipment and the plasma can be kept almost indefinitely in the refrigerator (Alsever, J. B., and Ainslie, R. B.: A New Method for the Preparation of Dilute Blood Plasma and the Operation of a Complete Transfusion Service, *New York State J. Med.* 41:126 [Jan. 15] 1941). This dilute plasma has been shown to be efficacious in the treat-

ment of shock (Besser, E. L.: Stored Dextrose-Citrate Plasma in the Treatment of Operative Shock, *Arch. Surg.* 43:451 [Sept.] 1941). The establishment of blood and plasma banks in thousands of smaller hospitals in the country not only would make these institutions more valuable in the treatment of the emergencies that arise in civilian practice but would also build a great military reserve which could be utilized much as the blood banks in cities in Great Britain are now being used in the treatment of air raid casualties.

ELMER L. DEGOWIN, M.D., University Hospital, Iowa City.

HEPARIN FOR PROLONGED COAGULATION TIME

To the Editor:—The remarks of de Takats in *THE JOURNAL* (Oct. 18, 1941, p. 1378) on the unusually prolonged coagulation time in our case of cavernous sinus thrombophlebitis treated with heparin are well received. Since this was the first case of this kind which we were fortunate enough to be able to treat with heparin, we attempted to approximate the regimen which had proved so successful in Schall's hands (*THE JOURNAL*, Aug. 23, 1941, p. 581). We are aware from the experience of others and our own subsequent experience that in cases of uninfected thrombophlebitis a coagulation time approximating twenty minutes seems to be adequate. However, in cases of septic cavernous sinus thrombophlebitis, in which the mortality is admittedly high and the prognosis always grave, it seems to us that a more prolonged coagulation time provides a greater margin of safety. We agree with de Takats that the complication which we encountered was due to the extremely high levels of coagulation time (three and four hours) which we attained. In any future cases we would attempt to avoid these extreme levels but still maintain a coagulation time considerably above twenty minutes.

It was not our intention to deter others from the use of heparin in any case of thrombophlebitis. Rather, we had hoped to help stimulate its more general use in these cases, but with a clearer realization of the occurrence of a complication which may ensue.

It remains for the future and the experiences of many observers to establish the optimum level of the coagulation time in these cases of septic thrombophlebitis.

IRVING L. ERSHLER, M.D.

IRL H. BLAISDELL, M.D.

Syracuse, N. Y.

SKIN TEST FOR DIAGNOSIS OF PREGNANCY

To the Editor:—It has recently been called to my attention by a number of physicians that a new cutaneous test for the diagnosis of pregnancy based on the report of Falls, Freda and Cohen (*Am. J. Obst. & Gynec.* 41:431 [March] 1941) is now being actively detailed by a commercial pharmaceutical organization as a "simplified, economical, reliable diagnostic skin test for pregnancy."

A recent report by Dr. Arnold F. Snyder and myself (*ibid.* 42:738 [Oct.] 1941) lists one hundred and fifty such tests using the exact technic described by Falls and his co-workers, in which an accuracy of only 75 per cent could be attained.

A word of caution should be interposed at this point in order to warn the practitioner not to be hasty in placing too much confidence in this reaction until further reports in the literature can support the contention of Falls and his colleagues in the accuracy of their test. Not only has the test been unreliable in our hands but a number of other investigators using smaller series of cases have informed me of the inaccuracy of this test in many instances.

ABNER I. WEISMAN, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec., Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, December 6, page 2002.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS. Parts I and II. Various centers, Feb. 9-11. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY. *Written. Part I.* Various centers, March 31. Final date for filing application is Dec. 31. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF INTERNAL MEDICINE. *Oral.* April in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association. Applications should be on file 6 weeks in advance of the date of oral examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY. New York, June. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY. *Written. Part I. Group B.* Various centers, Jan. 3. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY. *Oral and Written. All Groups.* Philadelphia, June, preceding the meeting of the American Medical Association. Final date for filing application is March 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PATHOLOGY. St. Louis, March 30-31. Final date for filing application is Jan. 30. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS. *Oral.* Los Angeles, April 22, preceding the Region IV meeting of the American Academy of Pediatrics. Cleveland, May 13, preceding the Region III meeting of the American Academy of Pediatrics. *Written. Locally.* February 14. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY. *Oral. All Groups.* Atlantic City, June 4. Final date for filing application is April 1. Sec., Dr. Byrl R. Kirklin, 102 110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY. *Written.* Various centers, December. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Illinois June Report

The Illinois Department of Registration and Education reports the written examination (graduates of foreign schools given also a practical test) for medical licensure held at Chicago, June 24-26, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Three hundred and twenty-eight candidates were examined, 310 of whom passed and 18 failed. The following schools were represented:

School	PASSED	Year Grad	Number Passed
Howard University College of Medicine. (1939), (1940)			2
Chicago Medical School (1937), (1940), (1941, 33)			35
Loyola University School of Medicine (1941, 46), (1941, 5)*			51
Northwestern University Medical School, (1939), (1940), (1941, 25) (1941, 5)*			32
Rush Medical College. (1939, 3), (1940, 17), (1940, 2)*			22
Univ. of Chicago, The School of Medicine (1940, 5), (1940, 3)*			8
University of Illinois College of Medicine, (1940), (1940)* (1941, 94) (1941, 15)*			111
Harvard Medical School. (1935)			1
St. Louis University School of Medicine. (1940)			1
Univ. of Rochester School of Medicine and Dentistry. (1940)			1
University of Oregon Medical School. (1940)			1
Hahnemann Med. College and Hospital of Philadelphia (1940)			1
Jefferson Medical College of Philadelphia. (1940)			1
University of Pennsylvania. (1938)*			2
University of Toronto Faculty of Medicine. (1937)*			1
McGill University Faculty of Medicine (1906), (1925), (1927), (1929), (1930), (1934), (1935), (1936), (1937) (1938)			13
Univerzita Komenského Fakulta Lekarská Bratislava. (1938)			1
Albert Ludwigs Universität Medizinische Fakultät, Freiburg. (1920), (1922)			2
Eberhard Karls Universität Medizinische Fakultät, Tübingen. (1919)			1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin. (1922), (1923)			2

Hamburgische Universität Medizinische Fakultät. (1924)	1
Johann Wolfgang Goethe Universität Medizinische Fakultät, Frankfurt am-Main. (1932)	1
Kaiser-Wilhelms-Universität Medizinische Fakultät, Strassburg. (1905)	1
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn. (1915), (1920)	2
Schlesische Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau. (1922)	1
National University of Athens School of Medicine. (1936)	1
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pécs. (1921), (1933)	2
Magyar Királyi Pázmány Péter Tudományegyetem Orvosi Fakultása, Budapest. (1939)	1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia. (1937)	1
Regia Università degli Studi di Milano. Facoltà di Medicina e Chirurgia. (1938)	1
Univ. Basel Medizinische Fakultät. (1916), (1939, 2), (1940)	4
Université de Lausanne Faculté de Médecine. (1939, 2)	2

School	FAILED	Year Grad	Number Failed
University of Toronto Faculty of Medicine. (1938)			1
Medizinische Fakultät der Universität Wien, (1921), (1922), (1924) (1935)			4
Deutsche Universität Medizinische Fakultät, Prag. (1932)			1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin. (1925)			1
Hamburgische Universität Medizinische Fakultät. (1922)			1
Johann Wolfgang Goethe Universität Medizinische Fakultät, Strassburg. (1920)			1
Wurzburg Universität Köln Medizinische Fakultät. (1923)			1
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pécs. (1923)			1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia. (1935), (1937)			2
Regia Università degli Studi di Genova. Facoltà di Medicina e Chirurgia. (1939)			1
Univ. Basel Medizinische Fakultät. (1916), (1939, 2), (1940)			1
Université de Lausanne Faculté de Médecine. (1939, 2)			1

Twenty-six physicians were successful in the practical test for reciprocity and endorsement applicants held in Chicago, June 26. The following schools were represented:

School	PASSED	Year Grad	Reciprocity with
University of Arkansas School of Medicine (1940)			Arkansas
Northwestern University Medical School. (1937)			Minnesota
Rush Medical College. (1938)			Ohio
Indiana University School of Medicine. (1936), (1939)			Indiana
University of Louisville School of Medicine. (1934)			Kentucky
St. Louis Univ. School of Medicine (1936), (1939), (1940, 3)			Missouri
Washington University School of Medicine (1937), (1940, 3)			Missouri
University of Nebraska College of Medicine. (1940, 2)			Nebraska
Ohio State University College of Medicine. (1936), (1939)			Ohio
Jefferson Med. College of Philadelphia (1930) Penna., (1931)			Minnesota
Meharry Medical College. (1938)			Tennessee
University of Wisconsin Medical School. (1938)			Kansas

School	PASSED	Year Grad	Endorsement of
Northwestern University Medical School (1941)			N.B.M.E.
McGill University Faculty of Medicine. (1935)			N.B.M.E.

* Licenses have not been issued.

Arizona October Report

The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, Oct. 7-8, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Eight candidates were examined, all of whom passed. Five physicians were licensed to practice medicine by reciprocity and 1 physician was so licensed on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists. (1940)			1
Northwestern University Medical School. (1939)			2
Rush Medical College. (1939)			1
University of Minnesota Medical School. (1940)			1
University of Nebraska College of Medicine. (1935)			1

School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
College of Medical Evangelists. (1921)			California
Northwestern University Medical School. (1934)			Texas
Rush Medical College. (1938)			Colorado
University of Minnesota Medical School. (1915)			Minnesota
University of Nebraska College of Medicine. (1935)			Nebraska

School	LICENSED BY ENDORSEMENT	Year Grad	Reciprocity with
Cornell University Medical College. (1934)			Illinois

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Liability of Medical Service Corporation for Negligence of Employees.—One of the defendants, a hospital association incorporated for profit, contracted with the Washington High School of Portland, Ore., "to provide medical and surgical and hospital services, . . . for the members of the football squad of the school." The plaintiff, a member of the school's football squad, injured his left shoulder and arm in games on Sept. 14 and Sept. 20, 1935. The day after the second game he visited the hospital association's offices and was given medical attention by one of the other defendants, Shields, a physician employee of the association. Shields made a diagnosis of an "acromioclavicular bruise," gave the boy analgesic balm to apply to the shoulder if he should ever again suffer a similar injury and advised him that he could continue to play football. Apparently the plaintiff had suffered a dislocation of the left shoulder and in playing in succeeding games suffered repeated dislocations, consulting employees of the association following several such injuries, but the condition remained undiagnosed. By the following August the shoulder and arm were in such a condition that surgery was the only available remedy. Eventually he brought an action for malpractice against the hospital association, two physician employees, Shields and Sisson, and a lay employee, Jones. The trial court sustained a motion for nonsuit as to the lay employee but denied it as to the other defendants. The jury found in favor of the plaintiff and, from judgment on the verdict, the hospital association and the physicians appealed to the Supreme Court of Oregon.

It was first contended that the defendant hospital association was not liable for any negligent acts performed by the defendant physicians because the physicians were independent contractors rather than employees of the association. The association, it appeared, was organized under the laws of Oregon to furnish medical, surgical and hospital services for profit. The defendant physicians were paid a monthly salary by the company and were furnished office space in the company offices. They were permitted to have their own patients but, in the offices furnished them, they rendered the professional services which the company agreed to furnish under its various contracts. Obviously, said the Supreme Court, under the circumstances, the relationship existing between the association and the physicians was that of master and servant and the association, by the doctrine of *respondeat superior*, is liable for the physicians' negligence. The association argued that the very nature of a physician's services precludes the physicians from being subject to the association's control and therefore makes the physicians independent contractors. While, answered the Court, in many instances the relationship between the parties may be tested by the right or lack of right to exercise control over an agent as to the manner and details of his work, in a case of this kind such a test cannot be determinative, since the test must give way to the rule that one cannot absolve oneself of contractual obligations by devolving the performance of those obligations on a stranger to the contract. If the hospital association has provided services in a negligent manner, it has not complied with its contractual obligations and it cannot secure immunity from liability for the negligence of the physicians it employed to perform its contractual obligations by pleading that it exercised due care in the selection of those physicians.

It was next contended that there was no evidence of malpractice against the association and the defendant Shields. The plaintiff testified that on September 21, the day after his second injury, he visited Shields in the office furnished by the defendant company and told him that in a football game on September 14, when a pile of players got off of him, it felt as though his shoulder had been broken because "the bone was sticking out, it felt like," that two of the officials of the game snapped it in

some way and it seemed to jump back in place, and that a similar injury was sustained in the game on September 20. The plaintiff then testified that Shields examined his arm, diagnosed his condition as an acromioclavicular bruise, gave him some analgesic balm to use if the same injury occurred again and told him that he could continue to play football. A physician, called by the defendants, on the basis of a history of the case given to him in August 1936, testified that at that time he made a definite diagnosis of recurrent dislocation of the shoulder and recommended an operation as the only remedy for the condition then existing. While, said the Court, there was no evidence that, in his examination of the plaintiff, Shields failed to use the tests approved by standard medical practice, it does not, however, necessarily follow that he was not guilty of negligence. There was medical testimony from which the jury could have found that the plaintiff, in recounting his injuries to Shields, described, characteristically, a dislocation of his shoulder, and therefore, the jury could have found that a physician, exercising ordinary care and skill in making his diagnosis, should have discovered the true nature of the plaintiff's ailment. It was conceded that the proper treatment for a recent dislocation of the shoulder was immobilization of the shoulder and arm for a period of time and that advice to the patient to play football would be highly improper. If, therefore, as the plaintiff testified and Dr. Shields vigorously denied, such advice was given, the evidence was sufficient to take the case to the jury, and the court committed no error in denying the motions for nonsuit and directed verdict with respect to the hospital association and Shields.

With respect to another one of the physician defendants, Sisson, the Court held that there was no evidence tending to prove that any act on his part was the proximate cause of the plaintiff's injury. The plaintiff contended, however, that since he had sued the defendants jointly, if negligence was proved with respect to any defendant, Sisson was necessarily also liable. The Court held, however, that in this case, essentially, the corporate defendant, the hospital association, had been sued for tort and with it were joined as defendants the corporation's employees who were charged with acting on its behalf in the commission of the wrongful acts. An employee cannot be held liable for the acts of a co-employee, said the Court, if he in no way participated in the acts on which the liability is sought to be predicated. Consequently Sisson's liability turns altogether on what he himself did or failed to do and he could in no wise be held responsible for the negligence of Shields. The Court accordingly held that the case should be dismissed as to Sisson.

At the trial, a witness called by the plaintiff was permitted, over objection, to testify that it was the policy of the high school concerned not to allow a boy to play football unless the hospital association "said it was all right to use him." The admission of this evidence, the Court held, was erroneous. The contract, said the Supreme Court, between the hospital association and the high school contained no provision requiring the company to keep the school authorities advised as to the physical condition of all the members of the football squad or to instruct the high school officials not to permit a boy to play because of his physical condition. The effect of the objectionable testimony was to inject into the case an issue not justified by the terms of the contract and not tendered by the plaintiff's complaint. Without this issue the whole case of the plaintiff depended on his unsupported testimony that Dr. Shields had advised him to continue playing football. If the jury believed Dr. Shields as against the plaintiff, it must necessarily have found for the defendants, because a wrong diagnosis in itself creates no liability. Since the testimony was received one may presume that it was commented on in argument, and, since there was no claim on the part of the defendants that any of them had advised the school authorities to have the plaintiff discontinue his football activities, prejudice to the defendants' case in all probability resulted.

The judgment was accordingly reversed and the cause remanded to the trial court with directions to enter a judgment of nonsuit in favor of Sisson and, apparently, to proceed with a new trial with respect to the hospital association and Shields. —*Ginsli v. C. H. Weston Co.*, 108 P. (2d) 1070 (Ore., 1941).

Malpractice: Alleged Failure of Dentist to Cure After Extraction and Discovery of Necrosis of the Mandible.—Fred Specht consulted the defendant dentist, Jan. 29, 1940, relative to a "loose tooth." After an examination, but without taking roentgenograms, the dentist extracted the tooth and discovered that his patient was suffering with necrosis of the mandible. Just what treatment, if any, the dentist then undertook, the reported decision does not make clear. The patient became ill with "systemic infection or streptococcus from which he died on February 6, 1940." The patient's mother instituted an action for damages against the dentist, alleging that in caring for her son the dentist had failed to exercise the care required of him by law in that before the extraction the dentist failed to have a proper roentgenogram taken, that the dentist failed to use sanitary, clean and sterilized instruments in the probing and extracting of the tooth and its root, that although the dentist discovered after the extraction that the decedent had a necrosis of the mandible and was in great danger of infection he failed to send decedent to a hospital to have the cavity properly curetted and failed himself to curet "properly, sanitarily, and sufficiently," and that the dentist negligently allowed his patient to become ill with "systemic infection or streptococcus" from which he died. The trial court sustained a general demurrer to the complaint and the decedent's mother appealed to the court of appeals of Georgia, division 2.

The Georgia code, section 84-924, said the court, requires a person professing to practice medicine or surgery for compensation to bring to the exercise of his profession a reasonable degree of care and skill. Any injury resulting from a want of such care and skill is a tort for which a recovery may be had. These provisions of the code apply also to a licensed dentist in the practice of his profession. The standard prescribed by the code when applied to the facts and circumstances of any particular case must be taken and considered to be such a degree of care and skill as, under similar conditions and like surrounding circumstances, is ordinarily employed by the profession generally. Not only must a dentist possess the requisite care and skill but he must exercise these qualifications. A dentist is not an insurer or warrantor that the exercise of his professional judgment will effect a cure of the patient. Nor is he obliged to bring to the exercise of his profession the utmost skill. If he measures up to the qualifications and applies the reasonable care and skill legally required of him he is not responsible for a mistake of judgment. If, however, an error of judgment is so gross as to be inconsistent with that degree of care and skill which a dentist should possess and exercise, liability may result when an injury is produced. A dentist in practicing his profession is under duty not only to use the requisite care and skill in a particular operation but also to give such after-treatment to the patient as the necessities of the case demand, in the absence of any special agreement to the contrary. Applying the aforestated principles of law, continued the court, to the facts alleged in the present petition, that in extracting the root of a tooth of the decedent the dentist negligently failed to use sanitary instruments and, on discovering that the jawbone of the patient was diseased and in great danger of infection, negligently failed to curet the cavity or to send the patient to a hospital for such after-treatment, in consequence of which alleged negligence "systemic poisoning or streptococcus" developed in the jawbone, causing the death of the patient, a jury question was presented as to whether or not the dentist was guilty of such gross error of judgment as to amount to a failure to exercise the requisite care and skill toward the patient, and the trial court erred in sustaining the defendant's general demurrer to the petition. The court accordingly reversed the judgment of the trial court in favor of the dentist.—*Specht v. Gaines*, 16 S. E. (2d) 507 (Ga., 1941).

Malpractice: Death from Pulmonary Embolism Following Tonsillectomy and Turbinectomy.—The patient underwent an operation for the removal of his tonsils and the turbinated bones of his nose, the operation being performed by a physician employed by the patient. A hospital resident physician, an anesthetist and an instrument nurse assisted in the operation. About five hours after the completion of the operative procedures the patient died, death being attributed to "pulmonary embolism of the left upper lobe of the lung, with an

infarct of the same upper lobe." Thereafter the widow and the son of the deceased patient brought suit against the hospital, the operating physician, the resident physician, the anesthetist and the instrument nurse. The trial court directed a verdict for the defendants and the plaintiffs appealed to the Court of Appeals of Maryland.

The operation was performed under a general anesthetic and an ether tube was used. The plaintiffs' evidence tended to show that this tube was left, unfastened, in the patient's mouth when he was returned to his room and that several hours later a friend visited the patient and found him unattended, "fighting for his breath" and waving "his hands in a frantic way." The patient died two hours later. The apparent contentions in this case were (1) that the defendants were negligent in permitting the ether tube to remain untied in the patient's mouth which "allowed the blood, serum and mucus to run down into the windpipe, clot, and stop the air from passing to the lungs," resulting in the patient's death and (2) that the patient was negligently left unattended in his hospital room after the operation. Before the plaintiffs can recover against any of the defendants, the Court said, it must be shown by affirmative evidence that they were either unskilful or negligent in their respective capacities and that such want of skill or care resulted in the death of the patient. "To constitute actionable negligence, there must be not only causal connection between the negligence complained of and the injury suffered, but the connection must be by a natural and unbroken sequence,—without intervening efficient causes,—so that, but for the negligence of the defendants, the injury would not have occurred. It must not only be a cause, but it must be the proximate cause." 22 R. C. L. 113.

The evidence in the record, the Court continued, pointed to no specific act of negligence on the part of any of the several defendants. Negligence, if any, must therefore be imputed from the fact that the patient was found gasping for breath, without an attendant or nurse in attendance in his room. But, said the Court, there was no evidence to show that, in the absence of the employment by the patient of a special nurse or attendant, it was incumbent on any of the defendants to see that an attendant was at his bedside at all times. Not only was there no evidence tending to prove any negligence on the part of the defendants, acting either collectively or in their several capacities, but the record contained affirmative testimony showing the proximate cause of the death to have been pulmonary embolism, such evidence being introduced at the instance of the plaintiffs. In the opinion of the Court, there must be something more than a showing that the evidence might be consistent with the plaintiff's theory of the cause of death. It must be such as to make that theory reasonably probable—not merely possible—and more probable than any other hypothesis based on such evidence. To justify a judgment for the plaintiffs, the Court said, the evidence must warrant an inference that the death resulted from the negligence of the defendants, or at least some one or more of them, rather than from some other cause. Since in the opinion of the Court the evidence in this case did not warrant such an inference, the action of the trial court in directing a verdict for the defendants did not constitute error.—*State, for Use of Kalivas v. Baltimore Eye, Ear and Throat Hospital, Inc.*, 10 A. (2d) 612 (Md., 1940).

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, Jan. 12-13. Dr. C. M. Peterson, 335 North Dearborn St., Chicago, Secretary.

American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Dively, 1103 Grand Ave., Kansas City, Mo., Secretary.

American Association for the Study of Neoplastic Diseases, Washington, D. C., Dec. 18-20. Dr. Eugene R. Whitmore, 2139 Wyoming Ave., N.W., Washington, D. C., Secretary.

Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore 11:677-740 (Sept) 1941

- *Human Infection with *Pasteurella Pseudotuberculosis* Rodentium of Pfeiffer. Report of Case. Emma S. Moss and J. D. Battle Jr., New Orleans—p. 677.
- *Changes in Hematologic Values in Elderly Patients. W. M. Fowler, R. L. Stephens and R. B. Stump, Iowa City—p. 700.
- Pathologic Relationship of Mesenteric Adenitis, Ileitis and Appendicitis. E. B. Erskine, Jamaica, N. Y.—p. 706.
- Value of Leukocyte and Differential Count in Diagnosis of Appendicitis. C. G. Smith, Philadelphia—p. 713.
- Early Carcinoma of Cervix. H. J. Schattenberg and J. Ziskind, New Orleans—p. 719.
- Malignant Thymoma. Clinical Pathologic Study of Eight Cases. C. A. Hellwig, Wichita, Kan.—p. 730.
- Autopsy Permit. O. Saphir, Chicago, and C. A. Hellwig, Wichita, Kan.—p. 733.

***Pasteurella Pseudotuberculosis* Rodentium Infection.**—Moss and Battle cite the sixth recorded case of human infection by *Pasteurella pseudotuberculosis* rodentium (Pfeiffer). The patient was a mulatto aged 34. The only history of contact with rabbits that could be established was that he had eaten cooked rabbit three weeks before. The strain of *Past. pseudotuberculosis* rodentium, isolated before death from the blood stream and after death from the blood stream, the spleen and an abdominal lymph node, was pathogenic for white mice and guinea pigs. The organism was recovered from the peritoneal exudate of the heart blood of the animals dying of the infection.

Hematologic Values in the Elderly.—According to Fowler and his colleagues, hematologic study of subjects aged 65 to 80 shows a slight reduction from the normal in the hemoglobin, erythrocyte and hematocrit values. The degree of the reduced erythrocyte count and hematocrit readings are in accord with the hemoglobin reduction, suggesting that a moderate anemia is present. Even at this age the values in women were slightly and consistently lower than those in men.

American Journal of Hygiene, Baltimore

34:39-70 Section A (Sept) 1941 Partial Index
65-90 Section B 63-140 Section C 23-64 Section D

Section A

- Study in Active Immunization Against Epidemic Influenza and Pneumococcal Pneumonia at Letchworth Village. I. Plan of Study. M. Siegel and R. S. Muckenfuss, New York—p. 39.

Section B

- Serologic Studies on Sugar II. Reactions of Antiserums of Type 2 Pneumococcus and of *Leuconostoc Mesenteroides* with Cane and Beet Sugars and with Cane Juice. J. M. Neill, J. Y. Sugg, E. J. Hehre and Evelyn Jaffe, New York—p. 65.
- Id. III. Reactions of Antiserums of Type 2 Pneumococcus and of *Leuconostoc Mesenteroides* with Sugars and Syrups of Palm Maple and Sorghum Origins and with Sauerkraut Juice. J. M. Neill, J. Y. Sugg, E. J. Hehre and Evelyn Jaffe, New York—p. 79.
- Survey for Leptospirosis in Southern California. M. R. Greene, Los Angeles—p. 87.

Section C

- Biochemical Reactions of Genus *Leishmania*. H. A. Senekj and N. Zebouni, Baghdad, Iraq—p. 67.
- Evaluation of Mosquito Proofing for Malaria Control Based on One Year's Observations. R. B. Watson and Helen C. Maher, Wilson Dam, Ala.—p. 86.
- Mosquito Proofing for Malaria Control from Standpoint of Construction Costs. C. C. Kiker and H. E. Breedlove, Wilson Dam, Ala.—p. 95.
- Implantation of Intestinal Trichomonads (*Trichomonas Hominis*) in Human Vagina. R. M. Stabler, L. G. Feo and A. E. Rakoff, Philadelphia—p. 114.
- Method of Action of Atabrine on Avian Malaria Parasite, Plasmodium Cathemerium. G. H. Boyd and M. Dunn, Athens, Ga.—p. 129.

Section D

- Therapeutic and Prophylactic Detoxication Anthelmintics. G. J. Martin, M. R. Thompson and N. J. Acousti, New York—p. 25.

Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill. 46:287-446 (Sept) 1941

- Surgical Treatment of Postirradiation Necrosis. E. M. Daland, Boston—p. 287.
- Electrosurgery (Electrocoagulation, Electrodesiccation) as Adjunct to Radiation Therapy in Treatment of Cancer. G. E. Pfahler and D. A. Sampson, Philadelphia—p. 302.
- Tuberculous Tracheobronchitis. Roentgenographic Appearance. W. R. Oechsli, Olive View, Calif.—p. 312.
- Hernia of Lung. Brief Review and Report of Case. A. Hartung and J. W. Grossman, Chicago—p. 321.
- Retention of Intraventricular Air Following Encephalography. Report of Two Cases of Unusual Duration. O. A. Turner, Rochester, Minn., and B. S. Brody, New Haven Conn.—p. 324.
- Roentgenologic Demonstration of Tumors of Gallbladder. J. D. Coate, Oakland, Calif.—p. 329.
- Dysostosis Multiplex. M. J. Hubeny and P. J. Delano, Chicago—p. 336.
- Unusual Metastatic Bone Lesions. R. A. Rendich and A. H. Levy, Brooklyn—p. 343.
- Multiple Bony Lesions Suggesting Myeloma in Pre-Columbian Indian. Aged 10 Years. G. D. Williams, St. Louis, W. A. Ritchie, Rochester, N. Y., and P. F. Titterton, St. Louis—p. 351.
- Prothrombin Formation Following Injury of Bone Marrow by Roentgen Rays. W. A. Barnes, New York—p. 356.
- Use of Iodized Oil in Roentgenography, with Animal Experimentation. T. A. Hartgraves, Phoenix, Ariz.—p. 362.
- Stray Radiation Under Actual Conditions. R. B. Taft, Charleston, S. C.—p. 373.
- Preliminary Studies on Dosage Measurements with Million Volt Roentgen Rays. Part I. Measurement of Quantity and Quality of Roentgen Rays in Supervoltage Range. Part II. Comparison of Tissue Doses from 200 Kilovolt and 1,000 Kilovolt Roentgen Rays. Edith H. Quimby and Elizabeth F. Foote, New York—p. 376.
- Stability of Standard Dosage Effect Curve for Radiation. C. I. Bliss, Woods Hole, Mass., and C. Packard, New York—p. 400.

American Journal of Surgery, New York 54:1-338 (Oct) 1941 Partial Index

- Anesthetic Procedures in Thoracic Surgery. S. C. Wiggan and P. E. Schultz, Boston—p. 4.
- *Postoperative Pulmonary Atelectasis. A. C. Niemeyer, Pueblo, Colo.—p. 18.
- Management of Acute Empyema in Children. T. H. Lanman and C. L. Dimmler, Boston—p. 29.
- Bronchiectasis. Morbidity and Mortality of Medically Treated Patients. H. M. Riggins, New York—p. 50.
- Principles in Management of Pulmonary Abscess. R. H. Betts, Boston—p. 82.
- Recognition and Management of Mediastinitis. W. E. Burnett, Philadelphia—p. 99.
- Logical Approach to Subphrenic Abscess. H. H. Faxon, Boston—p. 114.
- Relative Frequency and Site of Predilection of Intrathoracic Tumors. B. Blades, St. Louis—p. 139.
- Tumors of Thymic Region and Myasthenia Gravis. A. Block, Baltimore—p. 149.
- Intrathoracic Goiter. H. M. Clute and K. B. Lawrence, Boston—p. 151.
- Carcinoma of Lung as Surgical Problem. R. H. Overholt, Boston—p. 161.
- Bronchial Obstruction. Signs, Symptoms and Diagnosis. P. Holinger and A. H. Andrews Jr., Chicago—p. 193.
- Foreign Bodies in Lung. C. Jackson and C. L. Jackson, Philadelphia—p. 211.
- Foreign Bodies in Lung. C. Jackson, Philadelphia—p. 211.
- Recent Developments in Surgical Treatment of Pulmonary Tuberculosis. E. F. Butler, Ithaca, N. Y.—p. 215.
- Emergency Treatment of Pulmonary Hemorrhage in Tuberculous Patient. D. A. Cooper, Philadelphia—p. 224.
- Temporary versus Permanent Paralysis of Diaphragm in Treatment of Tuberculosis of Lungs. G. A. P. Hurley, Montreal, Canada—p. 228.
- Recognition and Management of Bronchopleural Fistula. W. Woodruff, Syracuse, N. Y.—p. 236.
- Recent Experience with War Wounds of Chest. J. E. H. Roberts and O. S. Tubbs, St. Albans, England—p. 289.
- Problem of Wound Sepsis in Thoracic Surgery. D. Hart, Durham, N. C.—p. 295.
- Deformities of Chest and Spine Resulting from Thoracic Disease and Operation. Their Prevention. J. D. Bisgard, Omaha—p. 317.

Pulmonary Atelectasis.—Niemeyer believes that in many localities postoperative pulmonary atelectasis is still being considered as pneumonia. Follow-up study certainly bears this out, as unrelieved atelectasis often will terminate as pneumonitis or pneumonia. The idea is too prevalent that the only true expression of this condition has, as its minimal lesion, a complete lobar collapse with its mediastinal shift, and thus the minor lobar involvements are not recognized, although they do but rarely cause death they contribute considerably to postoperative morbidity and in some instances lead to pneumonia. A sudden

elevation of temperature in the first twenty-four postoperative hours, with an exaggerated rise in pulse and respiration, should suggest atelectasis. Inhalation anesthesia given to patients with productive processes in the lungs and operation on the upper part of the abdomen should be considered as potential sources of pulmonary atelectasis, and postoperative prophylactic measures (thinning the bronchial secretions, assisting in expectoration by posturing, coughing and reexpansion of the collapsed lung by deep respirations) should be instituted immediately.

American Journal of Tropical Medicine, Baltimore

21:605-716 (Sept.) 1941

- *Studies on Murine Origin of Typhus Epidemics in North China II. Typhus Rickettsia Isolated from Mice and Mouse Fleas During Epidemic in a Household and from Body Lice in Garments of One Epidemic Case Wei T'ung Liu and S. H. Zia, Peiping, China—p. 605.
- Histoplasma Capsulatum Its Cultivation on Chorioallantoic Membrane of Developing Chick and Resultant Lesions M. Moore, St. Louis—p. 627.
- Natural Transmission of Infection from Patients Concurrently Infected with Two Strains of Plasmodium Vivax. M. F. Boyd, S. F. Kitchen and C. B. Matthews, Tallahassee, Fla—p. 645.
- Mammalian Toxoplasma in Erythrocytes of Canaries, Ducks and Duck Embryos. Fruma Wolfson, Baltimore—p. 653.
- Occurrence of Anopheles Darlingi Root in Central America. W. H. W. Komp, Washington, D. C—p. 659.
- Use of Solidified Carbon Dioxide in Developing Pressure for Spray-Killing Adult Mosquitoes in Malaria Control F. W. Knipe—p. 671.
- Classification of Measures of Malaria Prophylaxis and Mosquito Control. P. F. Russell—p. 681.
- Temperature of Incubation for Anophelines Infected with Plasmodium Falciparum M. F. Boyd, Tallahassee, Fla—p. 689.

Murine Origin of Typhus Epidemics.—Liu and Zia report that during an epidemic in a household they isolated two typhus strains from mice and mouse fleas and a third atypical murine strain from body lice of one of the patients. This isolation, they believe, justifies the view that in China, as in Mexico, the human body louse may under favorable circumstances transmit the murine rickettsia from man to man, giving rise to epidemics. In their household epidemic they found that in less than a month 8 of 9 persons living in the same house had contracted the disease. The house was heavily infested with mice, the mud floor showing many holes. There were no cats or dogs. The ninth member of the household at no time throughout the outbreak showed any signs of indisposition. All the members admitted that they harbored body lice through the greater part of the year and not infrequently noticed fleas in the clothing and bedding.

Cancer Research, Baltimore

1:595-684 (Aug.) 1941

- Toxicity and Carcinogenic Activity of 2 Acetaminofluorene R. H. Wilson, F. DeEds and A. J. Cox Jr., San Francisco—p. 595.
- Further Investigation on Transmission of Induced Tumors in Fowls J. B. Murphy and E. Sturm, New York—p. 609.
- Extraction of Carcinogenic Fraction from Human Urine. Preliminary Report R. Steele, F. C. Koch and P. E. Steiner, Chicago—p. 614.
- Production of Tumors by Transplantation of Normally Appearing Liver Cells from Animals Previously Injected with Methylcholanthrene W. A. Selle, P. Brindley and J. W. Spies, Galveston, Texas—p. 618.
- Transamination in Tumors, Fetal Tissues and Regenerating Liver. P. P. Cohen and G. L. Hekhus, New Haven, Conn—p. 620.
- Induced Resistance to Transplantable Lymphatic Leukemia in Rats E. Sturm, New York—p. 627.
- Nonspecific Nature of Induced Resistance to Tumors M. J. Eisen and W. H. Woglom, New York—p. 629.
- Estrogenic Effects of Adrenal Tumors of Ovariectomized Mice. W. U. Gardner, New Haven, Conn—p. 632.
- Occurrence of Estrogenic Hormone in Ovarian Cysts Ruth M. Watts and F. L. Adair, Chicago—p. 638.
- Some Cytologic Effects of Therapeutic Radiation. L. C. Fogg and S. Warren, Boston—p. 649.
- Further Studies on Effect of X Rays on Tumor of Known Genetic Constitution M. C. Reinhard, S. G. Warner and H. L. Goltz, Buffalo—p. 653.
- Genetics of Melanoma in Fishes: V. Reappearance of Ancestral Micro-melanophores in Off-spring of Parents Lacking These Cells M. Gordon, New York—p. 656.
- Neoplasm Studies. VIII. Cell Types in Tissue Culture of Fish Melanotic Tumors Compared with Mammalian Melanomas. C. G. Grand, M. Gordon and Gladys Cameron, New York—p. 660.

Endocrinology, Springfield, Ill.

29:165-290 (Aug.) 1941. Partial Index

- Does Pregnancy Suppress the Lactogenic Hormone of the Pituitary? C. W. Turner and J. Meites, Columbia, Mo—p. 165.
- Effect of Light on Sexual Maturation, Estrous Cycles and Anterior Pituitary of Rat Virginia Mayo Fiske, Cambridge, Mass—p. 167.
- Progesterone like Effect of Ascorbic Acid (Vitamin C) on Endometrium S. L. Israel and D. R. Meranze, Philadelphia—p. 210.
- Relation of Changes in Testicular Structure Induced in Rabbit by Estrogenic Substance to Resistance Against Syphilis. C. N. Frazier, C. K. Hu and W. C. Ma, Peiping, China—p. 218.
- Influence of Estrone on Electric Characteristics and Motility of Uterine Muscle. E. Bozler, Columbus, Ohio—p. 225.
- Hormone Content of Pharyngeal Pituitary Gland. S. Tolins, New York, and R. A. Moore, St. Louis—p. 228.
- Chronic Toxicity Studies of Diethylstilbestrol: II. Subcutaneous Implantation of Pellets in Rats R. C. Page, New York, H. K. Russell, White Plains, N. Y.; E. L. Schwabe, C. S. Matthews and F. E. Emery, Buffalo—p. 230.
- Influence of Hormones on Phosphatase Content of Rat Femur. I. Effects of Adrenal Cortical Substances and Parathyroid Extract H. L. Williams and E. M. Watson, London, Ont., Canada—p. 250.
- Id. II. Effects of Sex Hormones, Thyroxine and Thymus Extract H. L. Williams and E. M. Watson, London, Ont., Canada—p. 258.
- Release of Glutathione Inhibition of Melanin Formation by Estrone P. H. J. Figue, New Haven, Conn., and C. Allen, Baltimore—p. 262.
- Reproductive Organs in Malnutrition. Effects of Chorionic Gonadotropin on Atrophic Genitalia of Underfed Male Rats M. G. Mulinos and L. Pomerantz, New York—p. 267.
- Effects of Human Pregnancy Serum on Parturition in Rat. S. S. Rosenfeld, B. Lapan and H. Baron, New York—p. 276.

Journal of Experimental Medicine, New York

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- Preparation and Physicochemical Characterization of Serum Protein Components of Complement. L. Pillemier, E. E. Ecker, J. L. Oncley and E. J. Cohn, Cleveland—p. 297.
- *Studies on Agglutinin (Rh) in Human Blood Reacting with Anti Rhesus Serums and with Human Isoantibodies. K. Landsteiner and A. S. Wiener, New York—p. 309.
- Detection of "Masked" Virus (Shope Papilloma Virus) by Means of Immunization Results of Immunization with Mixtures Containing Virus and Antibody J. G. Kidd, New York—p. 321.
- Experimental Nephritis in Rats Induced by Injection of Antikidney Serum. V. Chronic Nephritis of Insidious Development Following Apparent Recovery from Acute Nephrotoxic Nephritis J. E. Smadel and H. F. Swift, New York—p. 345.
- Quantitative Chemical Studies on Complement or Alexin: III Uptake of Complement Nitrogen Under Varying Experimental Conditions. M. Heidelberger, M. Rocha e Silva and M. Myer, New York—p. 359.
- Influence of Character of Antibody on Velocity of Flocculation W. C. Boyd, Boston—p. 369.
- Experimental Gonococcal Infection of Chick Embryo T. Bang, Nashville, Tenn—p. 387.

Agglutinin in Human Blood.—Landsteiner and Wiener describe a test for determining the presence or absence of the new agglutinin (Rh), inherited as a simple mendelian dominant, in typing patients and prospective donors. The method for determining suitable serums consists in making serial dilutions by halves and testing with known negative and positive blood. Serums which show in three (or more) successive dilutions negative reactions with the former and positive ones with the latter blood are usable. Actual tests can be carried out by selecting a dilution of serum, e. g. 1:10, which gives no reactions with negative but definite reactions with positive blood, those serums that contain appreciable amounts of anti A or anti B agglutinins having been previously absorbed with small quantities of A and B blood. The blood to be tested should be fresh. An alternative method is to absorb the serums diluted, e. g. 1:4, with a quantity of blood (using A or B cells if indicated) sufficient to remove the reaction with Rh negative blood. Two drops of the test fluid are mixed with 1 drop of 2 per cent (in terms of blood sediment) freshly prepared washed blood suspension in a narrow tube and allowed to stand at room temperature. Readings are taken, after sedimentation has occurred, by direct lens inspection of the bases of the tube. Negatively reacting blood shows a circular deposit with a smooth edge, and positive blood has a wrinkled sediment with a serrated border or shows a granular deposit. A further microscopic examination in two hours, the sediment again being inspected after the tubes are gently shaken, will reveal negative blood samples to be homogeneous, and the positive ones will show various degrees of agglutination, frequently visible to the naked eye. The blood of 448 white persons was examined with

guinea pig and/or human serums; the blood of 379 was positive and that of the others negative, that is, 84.6 per cent were Rh+ and 15.4 per cent were Rh—. The blood of only 9 of 133 Negroes gave clearly negative reactions. This suggests the possibility of a racial difference in Rh distribution.

Journal of Immunology, Baltimore

41:259-374 (July) 1941

- Acquired Adaptation to Anesthetic Effect of Steroid Hormones. H. Selje, Montreal, Canada —p. 259
- Neutralization of Vaccine Virus by Immune Serum: Titration by Means of Intracerebral Inoculation of Mice. L. H. Bronson and R. F. Parker, Cleveland —p. 269.
- Extension of Separation of Types Among Pneumococci: Description of Seventeen Types in Addition to Types 1 to 32 (Cooper). Annabel W. Walter, Virginia H. Guevin, Marian W. Beattie, Hannah Y. Cotler and Helen B. Bucca, New York —p. 279.
- Studies of Passive Autosensitization and Desensitization: Two New Phenomena. O. Swineford Jr. and W. R. Mason Jr., Charlottesville, Va —p. 295.
- Absolute Rate of Phage Antiphage Reaction. A. D. Hershey, St. Louis. —p. 299.
- Optical Study of Reaction Between Transferred Monolayers of Lancefield's M Substance and Various Antisera. J. B. Bateman, H. E. Calkins and L. A. Chambers, Philadelphia —p. 321.
- Comparison of Antibody Production by Rabbits Following Injection of Pneumococcus Vaccines Heated at 60 C. or Autoclaved. E. G. Stillman, New York —p. 343.
- Electrophoretic Examination of Digested Serums. J. van der Scheer, R. W. G. Wyckoff and F. H. Clarke, Pearl River, N. Y. —p. 349.
- Leukopenic Action of Different Micro-Organisms and Antileukopenic Immunity. L. Olitzki, S. Avinery and J. Benderly, Jerusalem, Palestine —p. 361.

41:375-470 (Aug) 1941

- Immunochemistry of Allergens: I. Anaphylactogenic Properties of Proteic Component of Cottonseed. E. J. Coulson, Washington, D. C.; J. R. Spies, College Park, Md, and H. Stevens, Washington, D. C. —p. 375.
- Strain Specificity of Complement Fixation with Serums of Mice Immune to Virus of Influenza A and Swine Influenza. M. D. Eaton, Berkeley, Calif —p. 383.
- Antigenicity of Chick Embryo. J. van der Scheer, R. W. G. Wyckoff and E. Böhnel, Pearl River, N. Y. —p. 391.
- Isotonic Properties of Alcoholic Extracts of Brain. J. H. Lewis, Chicago —p. 397.
- Studies on Release of Histamine from Blood Cells of Rabbit by Addition of Horse Serum or Egg Albumin in Vitro. B. Rose and J. S. L. Browne, Montreal, Canada —p. 403.
- Effect of Histaminase Pretreatment on Histamine Shock in Guinea Pigs. B. Rose and J. S. L. Browne, Montreal, Canada —p. 409.
- Quantitative Studies on Group Specific Substances in Human Blood and Saliva: I. Group Specific Substance B. A. S. Wiener and L. Kosofsky, New York —p. 413.
- Immunity in Scarlet Fever: Dick Reaction, Circulating Antitoxin and Immunizing Dose. Betty S. Kolchin and I. T. Klein, with technical assistance of Irena Feig, Janet Waldman and Gertrude Cohen, New York —p. 429.
- Chemotherapeutic and Immunotherapeutic Testing of Eberthella Typhosa in Developing Chick Embryo. A. J. Weil and L. S. Gall, Pearl River, N. Y. —p. 445.
- Passive Immunization Against Experimental Infection of Mice with Influenza A Virus: Comparative Effect of Immune Serum Administered Intranasally and Intra Abdominally. R. M. Taylor, New York. —p. 453.

Military Surgeon, Washington, D. C.

89:609-736 (Oct.) 1941. Partial Index

- Medicine and Public Health in Our Program of National Defense. F. F. Russell —p. 609.
- Meditations on a March Through the Deep South. D. E. Penballow. —p. 616.
- Medical Conditions in West Indies. G. M. Saunders —p. 621.
- Psychosomatic Medicine in Military Practice. F. P. Pignataro —p. 632.
- Quick Frozen Foods—Fish. H. E. Hess —p. 638.
- Treatment of Diseases of Salivary Glands and Ducts. V. G. Walker. —p. 656.
- 'United States Drafts' Dental Defects of 1863, 1864, 1918 and 1940. B. R. East —p. 661.
- Recommendation for Use of Consolidated Graphic Progress Chart Toward the More Efficient Management of Gonorrhea in the Male. J. P. Pappas —p. 664.
- Treatment of Tetanus. M. L. Zee, A. T. Stein, M. F. Zeldes and M. L. Blatt —p. 685.

Dental Defects in Draftees.—East studied the data of physical examinations of draftees of two wars and the present national emergency. Defective and deficient teeth caused the rejection of 24.2 men per thousand in 1918. The rejection rates ranged from 102.85 per thousand for Vermont to 2.9 for Arkansas. Differences in criteria probably do not explain the

entire variation in rates. Dental defects defined as "loss of teeth" also played an important part in physical unfitness among the men drafted for the Northern army in the war between the states. The 1863 and 1864 draft data (Lewis, 1865) reveal that the highest rejection rates for dental defects then as in 1918 were in men from the New England states. The differences in rejection rates for the different areas in 1863 and 1864 and in 1918 correspond closely to rates of carious permanent teeth among the school children of twenty-six states examined in 1933 and 1934. The preliminary report from one hundred and twenty New York Selective Service boards shows that "missing teeth" were the most frequent cause for rejection. There is considerable evidence that the dental health of the population, as measured by physical fitness for military service, is growing worse instead of better despite a per capita increase in dental colleges and dentists and the recent extensive federal, state, city and private public dental health programs. Evidently the methods advocated and used for the last eighty years have not been sufficient to cope with dental diseases, particularly tooth decay. Since tooth formation is influenced during prenatal life, infancy and early childhood all agencies and professions concerned with maternal and child health have responsibilities and opportunities in research, education and practice in the field of dental health.

Minnesota Medicine, St. Paul

24:709-804 (Sept.) 1941

- Encephalitis. C. M. Eklund, Minneapolis —p. 723.
- New Developments in Diagnosis and Treatment of Brucellosis (Undulant Fever). W. M. Simpson, Dayton, Ohio —p. 725.
- Present Day Treatment of Compound Fractures, with Analysis of Twenty Five Consecutive Cases. T. M. Joyce, Portland, Ore —p. 735.
- Primary Treatment of Wounds. S. L. Koch, Chicago —p. 747.
- Human Blood Serum. Its Preparation and Use. R. B. Tudor and Ursula Janeczich, Hibbing —p. 749.
- Psychosomatic Medicine. L. R. Gowan, Duluth —p. 753.
- Section of Anal Sphincter. H. E. Hullsiek, St. Paul —p. 756.

Missouri State Medical Assn. Journal, St. Louis

38:303-330 (Sept.) 1941

- Fetal Maternal Interdependence: Nutritional and Metabolic Factors. M. Bodansky, Galveston, Texas —p. 303.
- Significance of Abnormal Vaginal Bleeding. W. M. Allen, St. Louis —p. 309.
- Local Isolation Treatment of Boils. Juan M. Stevenson, Cincinnati —p. 313.
- Diagnosis of Pernicious Anemia. M. P. Neal, Columbia —p. 316.
- Cervical Sinus Thrombophlebitis, Use of Serum and Chemotherapy in Its Management. Report of Seven Cases. E. S. Connell and B. C. Trowbridge, Kansas City —p. 320.
- Pregnancy Complicated by Carcinoma of Cervix. Report of Case. L. P. Kirtz and M. D. Pereira, St. Louis —p. 324.

38:331-364 (Oct.) 1941

- Significance of Hypertension and Renal Disease. C. L. Deming, New Haven, Conn. —p. 331.
- Premature Separation of Placenta. S. A. Cosgrove and D. F. Conway, Jersey City, N. J. —p. 334.
- *Painful Arm and Shoulder, with Especial Reference to Problem of Scalenus Neurocirculatory Compression. R. G. Spurling and E. G. Grantham, Louisville, Ky. —p. 340.
- Cardinal Principles of Sulfonamide Therapy. H. F. Flippin, Philadelphia —p. 344.
- Regional Enteritis. L. S. Fallis, Detroit —p. 348.
- Progress in Anesthetic Department of Kansas City General Hospital in 1940. W. C. Schriener and E. H. Grandstaff, Kansas City —p. 352.

Neurocirculatory Compression.—According to Spurling and Grantham, about 75 per cent of all patients with painful arms and shoulders (primary scalenus neurocirculatory compression) seen in the acute stage of the disorder have been improved or become asymptomatic after conservative treatment by keeping the arm up above the shoulder level with the hand behind the head as much as possible during waking hours and, if feasible, sleeping with the arm thus elevated. Tying the wrist to the head of the bed is a good way to maintain the posture during sleep. The local application of heat (the infra red lamp) over the scalenus muscle and the shoulder is also advised. Diathermy may be used if convenient. Operation is advised only for patients who fail to improve with reasonable conservative treatment.

Nebraska State Medical Journal, Lincoln

26:271-306 (Aug.) 1941

- Office Gynecology. J. L. Baer, Chicago.—p. 271.
Taking the "X" Out of X-Ray Treatment. J. T. Murphy, Toledo, Ohio.—p. 278.
Blood Dyscrasias in Newborn. J. C. Moore, Omaha.—p. 282.
First Aid and Transportation of Compound Fractures. J. E. M. Thomson, Lincoln.—p. 285.
Clinical Observations on Hypertension and Diabetes Mellitus. H. H. Zinneman, Lincoln.—p. 288.
Choice of Operation for Duodenal and Gastric Ulcer. H. H. Davis, Omaha.—p. 295.
Foreign Bodies of Ear, Nose and Throat. S. Z. Faier, Omaha.—p. 298.

26:307-342 (Sept.) 1941

- Study of a Patient. G. Herrmann, Galveston, Texas.—p. 307.
Problems of State Health Department. A. L. Miller, Lincoln.—p. 313.
Operation of "Blood Bank." B. C. Russum, Omaha.—p. 318.
Nutrition of Surgical Patients. J. D. Bisgard, Omaha.—p. 323.
Whooping Cough—Prevention and Treatment. F. Clarke, Omaha.—p. 328.

- Earache. H. E. Kully, Omaha.—p. 330.
Epidemic Encephalitis. R. S. Muckenfuss, New York.—p. 333.

26:343-378 (Oct.) 1941

- Reducing Surgical Risk in Patients with Renal Disease. H. M. Odell, Rochester, Minn.—p. 343.
The Aging Population, Its Influence on Cardiovascular Disease and a Consideration of Possible Prophylactic Measures. F. W. Niehaus, Omaha.—p. 348.
Common Mistakes in Medicine: Review of 500 Cases. F. J. Bean, Omaha.—p. 352.
Management of Some Minor Surgical Lesions of Fingers and Toes. C. W. McLaughlin Jr., Omaha.—p. 356.
Acute Appendicitis: Study of 1,006 Consecutive Cases. F. C. Hill and A. C. Fellman, Omaha.—p. 359.

New England Journal of Medicine, Boston

225:433-474 (Sept. 18) 1941

- Is There a Common Denominator in Scleroderma, Dermatomyositis, Disseminated Lupus Erythematosus, the Libman-Sacks Syndrome and Polyarteritis Nodosa? B. M. Banks, Boston.—p. 433.

- *Tuberculosis of Sternum. J. D. Wassersug, Middleboro, Mass.—p. 445.
Toxic Effects in Man of Overdosage with Sodium Sulfapyridine: Report of Case. F. B. Cutts and R. O. Bowman, Providence, R. I.—p. 448.
Gumma of Frontal Bone: Report of Case. N. P. Cosco, Middletown, N. Y.—p. 450.
Neurology. J. B. Ayer, Boston.—p. 452.

Tuberculosis of Sternum.—Wassersug discusses a series of 12 patients with tuberculosis of the sternum encountered among 1,134 with tuberculosis of bones and joints admitted to the Lakeville State Sanatorium between 1926 and 1940. Seven of the 12 were females and 5 males, and their ages varied from 1½ to 70 years. A history of trauma was not elicited, although 5 had had definite contact with tuberculosis. Eleven patients had other tuberculous foci. Tuberculosis of the sternum must be suspected when a swelling develops on the anterior wall of the chest in a patient with other tuberculous foci. The swelling was painless in 7 and painful in 3; in 2 a discharging sinus was the chief complaint. Eventually, one or more draining sinuses develop in every patient. Sternal tuberculosis must be differentiated from tuberculosis of the wall of the chest, ribs and costal cartilages. The tuberculosis of the sternum in 3 patients became arrested spontaneously, and the sinuses healed. In the others a variety of operative procedures was performed. The end results were usually good. Two patients are still hospitalized, and 1 died while in the sanatorium. Of the 9 discharged patients, 2 have died (1 of pulmonary tuberculosis and 1 of arteriosclerosis) without recurrence of the disease in the sternum. A third patient was taken by one of his parents to China and probably died en route. The remaining 6 patients were followed from ten months to eleven years and three months. Only slight drainage persists in the 1 patient followed for ten months. None of the other patients have had any recurrence of the disease in the sternum. All sinuses have remained healed, and there has been no swelling, pain or tenderness. However, 1 of the patients has far advanced pulmonary tuberculosis, and 1 has been bedridden for three years because of a cerebral hemorrhage. With regard to the deaths, tuberculosis of the sternum could not be regarded as a cause.

New Jersey Medical Society Journal, Trenton

38:431-494 (Sept.) 1941

- Treatment of Rickets with a Single Massive Dose of Vitamin D. I. J. Wolf, Paterson.—p. 436.
The Legal Responsibility of the Physician, with Special Reference to Physical Therapy. J. Rubacky, Passaic.—p. 441.
Twenty Years' Experience in Treatment of Carcinoma of Uterine Cervix and Breast with Radium. E. A. III, Newark.—p. 445.
Surgical Aspects of Peripheral Vascular Disease. H. Hantman, Newark.—p. 451.
Simultaneous Immunization with Combined Diphtheria-Whooping Cough Vaccine: Preliminary Report of Eighteen Month Study. H. Simon and C. V. Craster, Newark.—p. 461.
Neurogenic Factors in Peripheral Vascular Diseases. J. F. Pessel, Trenton.—p. 465.
Cancer of Rectum. H. W. Cave, New York.—p. 468.
Nasal Hemorrhage Originating in Maxillary Sinus. R. J. Vreeland, Paterson.—p. 473.
Atrophic Rhinitis. C. C. Charlton, Atlantic City.—p. 474.

New Orleans Medical and Surgical Journal

94:155-206 (Oct.) 1941

- Consideration of Fascia of Broad Ligament with Respect to Certain Surgical Procedures on Pelvis. V. S. Counseller, Rochester, Minn.—p. 155.
Acute Suppurations of Mouth, Pharynx and Neck. A. C. Furstenberg, Ann Arbor, Mich.—p. 162.
Vascular Thrombosis: Observation on Use of Heparin. W. H. Gillentine, New Orleans.—p. 169.
Rational Therapy of Thrombophlebitis. A. Ochsner and M. DeBakey, New Orleans.—p. 173.
Plasma Therapy. D. N. Silverman and R. A. Katz, New Orleans.—p. 178.
Peptic Ulcers, with Special Reference to Nonsymptomatic Type and Case Reports of Rupture into Peritoneal Cavity and Intestinal Hemorrhage. W. J. Norfleet, Shreveport, La.—p. 183.
Influenzal Meningitis: Successful Treatment of Case in Infant. Margaret Strange Bryan and J. H. Musser, New Orleans.—p. 188.
Anomalous Vein Encroaching on Fifth Lumbar Root as Cause of Sciatic Pain: Case Report. I. Redler and G. C. Anderson, New Orleans.—p. 190.
Large Solitary Abscess of Kidney. H. J. Lindner and M. E. Fatter, New Orleans.—p. 192.

North Carolina Medical Journal, Winston-Salem

2:469-528 (Sept.) 1941

- Developments in Medicine. F. H. Lahey, Boston.—p. 469.
Woman's Auxiliary. Mrs. P. P. McCain, Sanatorium.—p. 471.
Physical Status of Selective Service Draftees. E. D. Peasley, Raleigh.—p. 472.
*Massive Hemorrhage from Stomach: Its Diagnosis and Treatment. R. L. McMillan, Winston-Salem.—p. 476.
Treatment of Bacillary Dysentery in Infants. W. E. Keiter, Kinston.—p. 479.
Tuberculosis and National Defense. C. D. Thomas, Sanatorium.—p. 484.
Relative Bradycardia as Sign of Sulfonamide Fever. D. Cayer, Durham.—p. 486.
Manifestations of Recent Influenza Epidemic in Adults. W. deK. Wylie, Winston-Salem.—p. 489.
Influenza in Children. C. A. Street, Winston-Salem.—p. 490.
Influenzal Involvement of Upper Respiratory Tract. J. A. Harrill, Winston-Salem.—p. 491.
Neurologic and Psychiatric Aspects of Influenza. E. A. MacMillan, Winston-Salem.—p. 492.
Mixed Influenza Bacillus-Staphylococcus Meningitis Cured with Sulfonamide Therapy. R. W. Roberts, Durham.—p. 494.

Massive Gastric Hemorrhage.—McMillan states that few medical emergencies are as hazardous as gastric hemorrhage. After the shock from the loss of blood has been compensated the cause of the hemorrhage and its extent should be determined by diligent laboratory studies and a careful history. About 90 per cent of gross gastric hemorrhages result from erosion of a vessel in the base or the margin of a peptic ulcer. The author's procedure has been to keep the patient drowsy with opiates or soluble phenobarbital, giving only small amounts of cracked ice by mouth for eight to twelve hours and then 1 ounce (30 cc.) of whole milk and 1 of cream every hour. On the second day 3 ounces (90 cc.) of a thin plain gelatin solution is given three times a day along with the milk and cream. On the third day small amounts of soft boiled eggs, cereal and toast are added, and thus the diet is increased gradually. As a rule the patient's extreme anxiety is promptly allayed and he often sleeps without sedatives. Usually bleeding stops promptly and the signs and symptoms of shock disappear rapidly. One of the greatest and most frequent errors is to give blood transfusions too soon. Giving transfusions during active bleeding results in about a 20 per cent mortality. They are indicated only if the hemoglobin level falls to 30 per cent or the falling

systolic blood pressure is 90 mm. of mercury or less, when about 250 cc. of citrated blood should be given slowly by the drip method. The low blood pressure is nature's protecting mechanism against further bleeding. Routine early surgical intervention results in a mortality of about 15 per cent, although Lahey, operating only on patients more than 40 years of age, reported a 5 per cent rate. Operation on patients with ulcer is indicated only when bleeding is recurrent or when perforation, deep penetration, obstruction, evidence of a malignant growth or gastric ulcer which after three weeks of medical treatment is still 2 cm. or more in diameter exist. The author cites 12 cases of massive and 3 of moderate gastric hemorrhage. Three patients died. The 12 who survived were given a modified Meulengracht regimen early after bleeding. Of the 3 who died, 1 received repeated small transfusions and no food, 1 died of pulmonary embolism about twelve hours after gastric resection and 1 died of postoperative peritonitis following gastric resection for a highly malignant carcinoma. None of the patients fed early died except as a result of operation performed later on.

Public Health Reports, Washington, D. C.

56:1819-1862 (Sept. 12) 1941

- *Correlation Between Neutralizing Antibodies in Serum Against Influenza Viruses and Susceptibility to Influenza in Man. E. R. Rickard, F. L. Horsfall Jr., G. K. Hirst and E. H. Lennette.—p. 1819.
- Diurnal Variation of Urinary Lead Excretion. S. H. Webster.—p. 1834.
- Frequency of Disabling Morbidity by Cause, and Duration, Among Male and Female Industrial Workers During 1940, and by Cause Among Males During First Quarter of 1941. W. M. Gafafer.—p. 1848.

Serum Antibodies and Susceptibility to Influenza.—

Rickard and his co-workers determined the neutralizing capacities of acute phase and convalescent serums against influenza A and B viruses in patients in whom the diagnosis of influenza was established by laboratory tests. The data of the study show that there are correlations between the different levels of specific neutralizing antibodies and susceptibility or resistance to the infection by the different etiologic agents of influenza. However, high antibody levels against influenza A virus do not diminish the frequency of influenza B or vice versa. Influenza of unknown cause appears to occur with somewhat increased frequency among persons who possess considerable concentrations of antibodies against both influenza A and B viruses.

56:1863-1900 (Sept. 19) 1941

- *Studies on Efficacy of Complex Vaccine Against Influenza A. F. L. Horsfall Jr., E. H. Lennette, E. R. Rickard and G. K. Hirst.—p. 1863.
- Present Day Methods for Controlling Aedes Aegypti Mosquitoes. J. H. LeVan.—p. 1875.
- Influence of Dietary Factors on Therapeutic Activity of Sulfanilamide in Mice. S. M. Rosenthal.—p. 1880.

Complex Vaccine Against Influenza A.—

Horsfall and his co-workers present evidence that a single subcutaneous injection of the complex vaccine (prepared from chick embryos inoculated with influenza A virus and the X strain of canine distemper virus) four months prior to an epidemic of influenza caused a significant reduction in the incidence of influenza A among vaccinated persons. During October 1940 7,907 volunteers of a population of 17,595 in fifteen state institutions in Florida and Alabama were given the complex vaccine. The 9,688 persons who were not vaccinated were considered as normal controls. Approximately four months after the vaccine had been given, epidemics of influenza occurred in ten institutions, with a total of 1,450 cases of influenza. In four institutions (in which volunteers received a vaccine producing about one tenth as many antibodies as the vaccines used for the other volunteers) clinical influenza occurred in 11.4 per cent of control and in 9.3 per cent of vaccinated persons, and for the other six institutions the respective figures were 8.3 and 5.6. The available evidence indicates that no level of antibodies possessed by normal persons, even though it is high, can be taken to indicate complete immunity to influenza A. The disease was less frequent in persons with high antibody levels but it did occur. The fact that the incidence of influenza of unknown cause was not significantly reduced among the vaccinated persons is additional evidence for the specific relationship between antibody levels against one influenza virus and the probability of the occurrence of infection by the homologous virus.

South Carolina Medical Assn. Journal, Florence

37:267-290 (Oct.) 1941

- Study of Hookworm in South Carolina. J. C. Brabham, Union.—p. 267.
- Some Considerations Regarding Constipation. J. W. Kitchin, Liberty.—p. 269.

Southern Medical Journal, Birmingham, Ala.

34:1021-1092 (Oct.) 1941

- Congenital Pseudarthrosis of Tibia and Fibula: Report of Fifteen Cases. J. H. Kite, Atlanta, Ga.—p. 1021.
- Fibrin Calculi. C. D. Allen, Memphis, Tenn.—p. 1032.
- Trachoma Problems in Arkansas. K. W. Cosgrove, Little Rock, Ark.—p. 1037.
- *Gunshot Wounds of Pregnant Uterus. T. C. Bost, Charlotte, N. C.—p. 1040.
- Can the Site and Degree of Injury and Prognosis in Head Trauma Be Accurately Determined by Spinal Fluid Erythrocyte Counts? Experimental Study. J. M. Meredith, Richmond, Va.—p. 1043.
- Anesthesia for Intracranial Surgery. D. H. Stubbs, Washington, D. C.—p. 1051.
- Nephritis. F. G. Speidel, Louisville, Ky.—p. 1057.
- Fundamentals of Treatment of Psychoneuroses. H. K. Richardson, Baltimore.—p. 1061.
- Psychosoma: The Mind-Body Problem, with Special Reference to Gastro-intestinal Tract. H. G. Rudner, Memphis, Tenn.—p. 1066.
- *Acne Vulgaris, a Pustular Lipidosis: Successful Treatment Based on Control of Lipid Metabolism by Low Fat Diet and Thyroid Extract. R. L. Sutton Jr., Kansas City, Mo.—p. 1071.
- Laryngotracheobronchitis. V. D. Hagaman, Jackson, Miss.—p. 1082.
- Girl Born Without Legs and Without Arms: Report of Case. J. L. Levy, Clarksdale, Miss.—p. 1085.

Gunshot Wounds of Pregnant Uterus.—For the thirty years since 1910 Bost finds that 9 cases of gunshot wounds of the uterus during pregnancy have been reported. He cites the tenth case. Unlike concurrent disease and trauma pregnancy apparently offers a protective mechanism against gunshot wounds. The mortality (1 of the 10 mothers died, and of the 6 viable infants 2 died) appears to be much less than the general mortality from gunshot wounds of the abdomen. Indications for opening the abdomen appear to be the same as though the pregnancy did not exist. When the abdomen is explored and no serious injury to the viscera is found except to the uterus the general opinion is that the uterus should be emptied by cesarean section if the uterine cavity has been penetrated. However, hysterectomy was done "to arrest pelvic hemorrhage" for 2 patients, 1 was operated on (the bullet was removed and the child delivered normally seventeen days later) and 1 was not operated on and labor came on and a living child was delivered normally three days later. The author's case illustrates the importance of a flat roentgenogram when there is no exit wound to determine the course of the bullet so that the proper incision can be predetermined. It shows also that a negative urinalysis does not rule out injury to the bladder.

Acne Vulgaris.—Sutton believes that an acne lesion, shallow or deep, is a foreign body reaction to oily epidermal material and suggests seborrhea. Comedo and acne vulgaris are analogous to diabetes mellitus. In diabetes, an excess of carbohydrate collects beyond the body's ability to metabolize it. In acne, an excess of lipid collects, provoking pustular foreign body reactions; acne is controllable by reducing lipid intake and enhancing lipid metabolism, if necessary, by giving thyroid. Acne vulgaris in the author's opinion is a pustular lipidosis. A carefully designed low fat diet, under supervision, is effective in diminishing seborrhea. No ill effects in more than 400 patients with acne have followed such diets. The patients had definite relief from fatigability, constipation and mental depression, while at the same time their acne improved. The constitutional symptoms of patients with ordinary acne are due to their relative hypothyroidism. By "relative" the author means the inadequacy of the autochthonous hormone to cope with the quantity of lipid ingested. Constipation is not a cause of acne; patients with acne are constipated for the same reason that they have acne, menstrual difficulties, anemia and "that tired feeling." These are all accompaniments of hypothyroidism. Thyroid is given to all patients. Objective improvement, diminution of seborrhea, is visible in a week. Improvement is obvious in a month, and from three to six months are required for cure. The diet is tentatively broken after the skin has become normal, being enriched particularly in vitamin A, and the patient determines by experiment what his lipid tolerance is.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

38:91-122 (July-Sept.) 1941

*Varicella and Herpes Zoster: Report of Three Illustrative Cases. R. M. Campbell.—p. 91.

Varicella and Herpes Zoster.—Campbell reports 3 cases in which the vesicular eruptions characteristic of herpes zoster and chickenpox appeared concurrently. Only 1 patient was a child, following whose illness an outbreak of chickenpox affected 13 children in a ward. Sources of infection other than the infant with coexisting herpes zoster and varicella were excluded. The author believes that the unicist theory, that the viruses of the two diseases are one and the same, is inadequate to explain the facts. The absence of regular cross immunity is a serious objection to such a close interrelationship of the viruses of herpes zoster and chickenpox.

British Journal of Radiology, London

14:275-306 (Sept.) 1941

Pyelorenal Backflow. E. R. Williams.—p. 275.

Radium Distribution Factor in Carcinoma Cervix Therapy, with Comparison of Techniques. B. Sandler.—p. 284.

Lymphogranuloma Inguinale Producing Rectal Stricture: Case. R. I. Lewis.—p. 298.

Homogeneity of Dosage Distribution in Radiation Teletherapy. H. T. Flint and C. W. Wilson.—p. 300.

Research into Physical Factors Concerned in Indirect Radiography: Paper V. Effect on Luminous Output of Variation of Crystal Size of Fluorescing Material. B. Stanford.—p. 304.

British Medical Journal, London

2:393-428 (Sept. 20) 1941

Operability of Carcinoma of Rectum. J. C. Goligher.—p. 393.

Parasitology of Scabies. P. A. Buxton.—p. 397.

*Treatment of Scabies: Use of Sulfur Lather Tablets. Dorothy L. Carter.—p. 401.

*Scabies Treated by Benzyl Benzoate Emulsion. I. F. Mackenzie.—p. 403.

*Transmission of Scabies. K. Mellanby.—p. 405.

Sulfur Lather Tablets for Scabies.—Carter adds a method to the list of sarcopticides which she believes has certain advantages over other methods, especially in children. The principle of the treatment was first described in America (Nolan, 1937), but instead of using sulfur soap as Nolan did the author used a tablet in which the amount of sulfur suggested as adequate, 0.72 Gm., was incorporated with a lathering agent. The lathering method is effective, especially in children, and the chance of dermatitis seems to be negligible in that the patient is given three tablets and treatment can be carried out at home without the fear of overtreatment by the zealous minded. Scrubbing was not necessary for children, in whom a hot bath and a rub-down with a flannel cloth was sufficient. None of the children complained of pain after lathering, even those with denuded or septic areas. However, the author concludes that the basic problem lies in preventing the rapid spread of the disease, and this means control and treatment of contacts and the reservoir of untreated persons. This involves inspection and treatment of every member of a family in which scabies has occurred, and also the immediate disinfection of all their clothing and bedding. If this was applied only to school children the plan would be effective in reducing materially the incidence of scabies.

Benzyl Benzoate Emulsion for Scabies.—Mackenzie believes that the increase in scabies presents a problem of considerable complexity and of no little importance to the maintenance of the sustained national effort demanded at the present time. In a group of patients recently treated by him there was a relatively high proportion of affected families with no history of previous infection. He discusses the results obtained with a benzyl benzoate emulsion ("proscabin," Bayer). After a hot bath, the body having been well lathered with soap and scrubbed, the skin was dried and proscabin was brushed on the whole surface of the body. Badly affected parts were repainted immediately after the first application had dried. The previously worn clothing was then put on. The bath and painting were

repeated on the second day and clean underwear was used. Parents were advised to change and disinfect their bedclothes. Two days later the patient was examined, and when treatment had been successful it was usual to find that scratching had ceased and that the most affected areas looked dull and brown in contrast to the many bright pinkish points normally distributed in the scratched areas. The crusted or pustular areas of secondary infection were treated with a 1 per cent ammoniated mercury ointment, after the two proscabin treatments. A second and third course of two treatments may be deemed necessary for some persons. The author suggests that the handling of infested articles (books, towels and so on) by uninfected school children may be a means of carrying scabies to previously uninfested households.

Transmission of Scabies.—Mellanby describes experiments determining exactly how scabies is normally transmitted. The experiments were made on volunteers (pacifists) living under controlled institutional conditions who agreed to submit to infection and to allow the course of the disease to be followed on their persons. The volunteers used bedding and underclothing from one to seven days after they had been used by patients with scabies and beds and underclothing immediately after being vacated and removed by patients with scabies. The men were inspected daily for about a month (sometimes longer) after each experiment. Two volunteers finally became infected, and thus it was possible to test the effects of personal contact. Four uninfected volunteers slept in beds with men with scabies. In 3 instances the volunteer and the infected man slept together for seven nights, and mites were found on all 3 volunteers after eight, nine and twelve days from the start of the experiment. Scabies did not develop in the fourth volunteer, who slept under these conditions for two nights. The author believes that scabies is normally transmitted by slight personal or venereal contact. He believes that one reason for the importance attached to fomites in the transmission of scabies is that lice are known to be spread by this means. He thinks that the evidence presented is not sufficient to say that disinfection of clothing and blankets is unnecessary in cases of scabies, though the conclusion seems probable. When reinfestation of a patient is being attributed to fomites the following possibilities should be excluded: contact with another person with scabies, incomplete cure and as certain lesions remain visible and irritant for weeks after cure reinfestation or relapse cannot be stated to have occurred unless living mites were found.

Journal of Laryngology and Otology, London

56:189-224 (June) 1941

Injuries of Ear. H. M. Jones.—p. 189.

Mucocele of Pharyngeal Ventricle, Simulating a Laryngocele. P. Reading.—p. 204.

Lancet, London

2:331-358 (Sept. 20) 1941

Enuresis Treated by Urethral Dilatation. H. P. Winsbury-White.—p. 331.

Traumatic Asphyxia. J. G. Bonnin.—p. 333.

Plump Type of Graves' Disease. W. R. Trotter and K. C. Eden.—p. 335.

Simple Method for Estimating Proteins in Plasma or Serum. W. W. Walthers.—p. 337.

Renal Glycosuria with Hypoglycemia. I. Macpherson.—p. 338.

Icterus Gravis Neonatorum Cured by Splenectomy. C. Hardwick and O. Lloyd.—p. 339.

Medical Journal of Australia, Sydney

2:249-280 (Sept. 6) 1941

Effect of Exercise in Hot Atmospheres on Salt Water Balance of Human Subjects. D. H. K. Lee, R. E. Murray, W. J. Simmonds and R. G. Atherton.—p. 249.

Review of Five Hundred Consecutive Cancer Autopsies. R. A. Willis.—p. 258.

Echinoderm Injuries in Nauru. K. V. Earle.—p. 265.

Medical Pamphlet of 1845. C. Craig.—p. 266.

2:281-310 (Sept. 13) 1941

Treatment of Certain Blood Diseases and of Hematemesis by Direct Blood Transfusion. J. A. McLean.—p. 281.

Case for Transfusion of Unmodified Blood. J. Smith.—p. 286.

Selection of Method of Blood Transfusion. A. C. McEachern.—p. 299.

Appreciation on Medical Man Power of Western Australia, with Special Reference to Economy of Personnel. N. M. Culbert.—p. 293.

Schweizerische medizinische Wochenschrift, Basel**71:921-948 (Aug. 9) 1941. Partial Index**

- Biologic Significance of First Year of Life in Human Subjects. A. Portmann.—p. 921.
Genital Hemorrhages as Sign of Gynecologic Disorders. H. von Wattenwyl.—p. 924.
Subacute Inflammation of Pancreas During Pregnancy. J. W. Grott.—p. 930.
Possibility of Traumatic Genesis of Closure of Vena Centralis Retinae. E. Haemig.—p. 933.
*Treatment of Influenza, of Lacunar Tonsillitis and of Otitis Media with Sulfathiazole. K. Sigg.—p. 935.
Leprosy. W. Racine.—p. 936.

Sulfathiazole in Influenza, Tonsillitis and Otitis.—Sigg employed sulfathiazole in 28 cases of influenza, 8 cases of lacunar tonsillitis and 12 cases of otitis media. It is noteworthy that the patients with influenza always show critical defervescence after sulfathiazole therapy. The temperature becomes normal in forty-eight hours. The rapid fever reduction is especially evident in the patients who have had fever for some time before the administration of sulfathiazole. In tonsillitis and otitis, the action of sulfathiazole is proved not only by the behavior of the temperature but by the disappearance of the tonsillar coating and of the redness of the tympanic membrane. In lacunar tonsillitis, the fever subsides in thirty to forty-eight hours, irrespective of the stage during which the sulfathiazole treatment is begun. The tonsillar coating disappears in two to three days, that is, the patient feels subjective improvement before the objective signs have subsided. In otitis media the fever disappears from twenty-four to thirty-six hours after onset of the sulfathiazole medication. While perforation of the tympanic membrane or running of the ear occurred in none of the 12 patients with otitis media treated with sulfathiazole, the author saw 3 patients with otorrhea for whom sulfathiazole had not been used; however, these too were cured without further local treatment when sulfathiazole was given. The author recommends large initial doses. He gives 4 or 5 Gm. on the first day, 3 Gm. on the second, 2 Gm. on the third and 1 Gm. on the fourth day. If there is no reduction in temperature at the end of the first day the larger dose given on the first day must be continued. The doses can be smaller for children. In patients with influenza the medication may cause vomiting, but sulfathiazole causes no other undesirable effects.

Revista Médica Brasileira, Rio de Janeiro**11:1-84 (July) 1941. Partial Index**

- *BCG Vaccine Against Tuberculosis. R. de Carvalho Loures.—p. 43.
BCG Vaccine.—De Carvalho Loures reports his personal experience in vaccinating 651 newborn infants from 1938 up to 1940 with BCG vaccine. He concludes that the BCG vaccine is harmless, has no contraindications and protects infants against tuberculosis and other infections. The vaccine should be given as a routine to all newborn infants, preferably during the first ten days of life. Isolating the infants after vaccination for a given time is necessary, but the impossibility of isolating them is not a contraindication for administration of the vaccine. Infants of poor families, among whom tuberculous contacts are frequent, should be vaccinated by all means. The appearance of tuberculin allergy is the indication of the use of the vaccine by the body. Prevention against tuberculosis is maintained by repeating vaccination at certain intervals.

Revista Médica de Rosario, Rosario de Santa Fe**31:619-720 (July) 1941. Partial Index**

- *Myxedema Heart. L. González Sabathie, V. S. Terán and C. Vidal.—p. 619.
Thrombosis of Pampiniform Plexus in Vaquez Disease. R. Ercole, T. C. Minnhaar and A. Fort.—p. 644.

Myxedema Heart.—González Sabathie and his collaborators observed the behavior of the heart and of the blood pressure in 15 patients with myxedema heart, which developed spontaneously in 13 and after subtotal thyroidectomy in 2. All patients but 1, a boy, were women over 40, except 4 who were over 30. The boy was 17. The heart was greatly enlarged in 12 cases and latently enlarged in 1. The enlargement was uniform for all the chambers of the heart. In some cases the transverse diameter of the heart, as determined in relation to the transverse diameter of the thorax in teleroentgenograms, was 20 cm. The maximal arterial pressure was over 160 mm. of mercury in 4

cases and between 140 and 160 mm. of mercury in 3. There was insufficiency of the heart in 4 and angina pectoris in 3. The pulsation of the contour of the heart was diminished in all cases in which roentgenoscopic observations were performed. The electrocardiogram was changed in all cases. The most typical electrocardiographic changes were flattening of the P wave, flattening or inversion of the T wave, especially in the first and second leads, and low voltage of the QRS complex in the three standard leads. Elongation of the PR interval and widening of the QRS complex were rarely observed. There were a case of auricular extrasystole and another case of complete arrhythmia. After thyroid therapy the size of the heart diminished in all cases, except when the enlargement was due to heart disease. The arterial pressure diminished in the majority of cases. The electrocardiogram gradually became normal in all cases in a given time, which varied. Favorable changes were evident after four to eight weeks. In some cases the electrical axis changed from normal to deviated or the reverse. In a case of moderate hypertension and moderate enlargement of the heart, extrasystolic arrhythmia disappeared. The electrocardiogram had a substantial favorable change. The transverse diameter diminished 1.3 cm., without reaching, however, the normal size. In a case in which the changes of the electrocardiogram were typical and the heart was of normal size the electrocardiogram became normal after thyroid therapy and the transverse diameter of the heart diminished 1.5 cm. The size of the heart did not change in a case of severe hypertension and heart disease of arterial origin. In a case of angina pectoris the anginal symptoms disappeared during thyroid therapy and reappeared because of insufficient treatment. In 2 cases of typical insufficiency of myxedema heart the electrocardiograms became normal and the symptoms rapidly improved after the administration of thyroid therapy. In 1 there were anginal symptoms for the first time in the course of the treatment. Treatment was discontinued for some time and then was reestablished with tolerable doses. The symptoms of congestive cardiac insufficiency in 2 cases in which thyroidectomy had been done were controlled by thyroid therapy.

Münchener medizinische Wochenschrift, Munich**88:641-668 (June 6) 1941**

- Use of Bacteriophages in Combating Dysentery. G. Seiffert.—p. 641.
*Statistics on Kruse-Sonne (E) Dysentery: The Infectious Intestinal Disease Most Prevalent in Germany. K. Roelcke and Maria Neuberger.—p. 643.
Surgical Treatment of Visual Disturbances in Cerebral Tumors. W. Sörgo.—p. 646.
Population and Health Policies in Germany. J. Krug.—p. 651.
Question of Expelling Mucous Secretion from Bronchi. H. Weber.—p. 656.

Statistics on Kruse-Sonne (E) Dysentery.—Roelcke and Neuberger maintain that Kruse-Sonne dysentery has shown a considerable increase in Germany during the last ten years, and they present statistical data of the Heidelberg medical laboratory to prove it. This condition is not sufficiently recognized, in spite of its increase, because it may present the aspects not only of dysentery but of enteritis. They present a table which lists 825 cases in which a pathogenic intestinal micro-organism was detected at the Heidelberg laboratory between 1932 and 1940. It is noteworthy that during these nine years the Shiga-Kruse bacillus was never detected, whereas the cases of Kruse-Sonne dysentery amounted to 462, or 56 per cent, of the total number. If one looks at the figures for the different years, a rising tendency becomes apparent. Kruse-Sonne dysentery occurs not only in individual patients but in groups, and if the ages of the patients are considered it becomes apparent that the disease is most frequent in children under 10 years of age. A curve indicating the seasonal distribution discloses the highest incidence in June, July, August and September. The regional distributions suggests that the geologic character of the land may play a part. Investigating the figures on intestinal infections for all of Germany, the authors found that the incidence of Kruse-Sonne dysentery was only slightly surpassed by that of paratyphoid. Whereas cases of paratyphoid B amounted to 31.1 per cent of the total intestinal infections, cases of Kruse-Sonne dysentery amounted to 30.8 per cent. The Kruse-Sonne bacillus accounts for over 85 per cent of all cases of dysentery in Germany; the Shiga-Kruse bacillus occurs rarely. It is probable

that the incidence of Kruse-Sonne dysentery is much greater than the aforementioned figures indicate, because the clinical picture produced by this bacillus is often so mild that medical aid is not requested or that bacterial examination is dispensed with.

Archiv für Japanische Chirurgie, Kyoto

18:511-612 (May) 1941. Partial Index

*Results of Intrabronchial Injection of Moljodol in Chronic Empyema Patients. K. Yokota.—p. 557.

*Rosenstein's Mesenteric Pressure Pain Symptom and Its Surgical Significance. M. Matsuda.—p. 574.

Bronchial Picture in Chronic Empyema.—Yokota reports the results of his study of bronchograms of 15 patients with chronic empyema and of fistulograms in 2 children. The contrast medium employed was 40 per cent moljodol (an iodized oil) injected by the supraglottic method; in children with bronchial fistula the injection was accomplished by means of a syringe and a catheter. The three factors responsible for bronchial changes in chronic pyothorax were found to be (1) pressure on the affected side from accumulated pus, (2) scarred fibrotic changes of the alveolar parenchyma on the pleural induration and (3) contraction as a result of the pulmonary tuberculosis demonstrable in practically all cases of chronic pleural suppuration. In cases of partially involved chronic pyothorax the typical changes of the bronchi were seen in the middle and upper lobes of the right lung and the lower lobe of the left lung but never in the upper lobes on the two sides simultaneously. In total pyothorax, on the other hand, all lobes may be involved. In 4 instances the presence of a tuberculous cavity was demonstrated. Three of 4 patients in whom tuberculous bronchial changes were demonstrable in all lobes of the lungs died after extrapleural thoracoplasty, while 2 patients with no evidence of tuberculous changes of the bronchi went on to complete recovery. From these observations the author concludes that the prognosis of thoracoplasty can be predicted from the character of bronchograms. Fistula was demonstrated and the bronchi leading to the fistula showed remarkable changes, in 7 cases. These data were obtained by means of fistulography, which is also a valuable diagnostic aid in the surgery of diseases of the chest.

Rosenstein Syndrome and Movable Cecum.—Rosenstein (1920) proposed that the syndrome of mesenteric pressure pain is a simple differential diagnostic sign of appendicitis, and Torikata (1924) concluded that the Rosenstein-Inversus syndrome, which is the disappearance of ileocecal pressure pain present in the recumbent position on lying on the left side, is the pathognomonic sign of movable cecum (cecum mobile). The Rosenstein syndrome is due essentially to the pain arising from the elevation of the lateral peritoneal membrane from the retroperitoneal tissue; the presence of this syndrome in the absence of any signs of acute inflammation of the peritoneal cavity is diagnostic of movable cecum. All signs of mobile cecum may be removed by simple resection of the vermiform appendix. In all cases of movable cecum with a positive Rosenstein syndrome, the pericolic membranous tissue must be resected and the cecum must be fixed to the ascending colon; failure to carry out this procedure leads to chronic persistence of the syndrome.

Kekkaku, Tokyo

19:303-418 (May) 1941

*Experimental, Histopathologic and Clinical Studies on the Therapeutic Effect of Thymophogen on Tuberculosis. K. Ikeda.—p. 303.

Thymophogen in Tuberculosis.—Ikeda reports his observations on the therapeutic effect of sodium mono-4-chlorothymylphosphate (thymophogen) in tuberculosis. This drug was first used in 1930, when Ayukawa tested its bactericidal properties on *Mycobacterium tuberculosis* and found it to be efficacious because of the liberation of tetrachlorothymol in the tissue resulting from the hydrolytic action of the phosphoric acid enzymes. In animal experiments, using rabbits, the author injected 0.2 mg. of tubercle bacilli suspended in 1 cc. of saline solution either intravenously or directly into the parenchyma of the lung, simultaneously administering the test drug in doses varying from 0.04 to 0.4 Gm. as a 4 per cent solution. The

injections were made every other day for a total of one hundred and sixty days. On the basis of both clinical and pathologic observations the author noted that the animals receiving injections of the drug, as compared with the control animals, gave evidence of satisfactory therapeutic effects of the drug on the disease. In contrast to the control group, the treated animals showed a greater degree of fibrosis and calcification of the tubercles in the lungs. Furthermore, the author tested the phagocytic activities of the reticuloendothelial cells, with special reference to the alveolar macrophages (called pneumocytes by Shimomura) and found that these protective elements of the body were more active in the animals with experimental tuberculosis under treatment with the test drug than they were in the control animals. As a final phase of investigation, the effect of the test drug in cases of human tuberculosis was studied. For this purpose, the author selected 30 tuberculous patients with active disease and gave intravenous injections of the drug in doses varying from 0.2 to 1 Gm. at two day intervals, for a total number varying from thirty to ninety-eight injections. Of the total number of patients so treated, 14 showed definite signs of improvement due to the drug while the remainder appeared to be unaffected.

Taiwan Igakkai Zassi, Taihoku, Formosa

40:1009-1180 (June) 1941. Partial Index

*Leprosy in Canton, China: A Survey. S. Rai.—p. 1133.

Leprosy in Canton.—While he was serving on the quarantine service, Rai made a survey of leprosy among the inhabitants of Canton. It has been estimated that nearly one million lepers, or approximately one third of the total number of lepers in the world, are found in China, where they are especially numerous in the province of Canton. Of the 52,000 inhabitants who came to the attention of the author, 84 (1.6 per cent) were found to show various symptoms of leprosy. Males predominated (55) over females (29); the oldest patient was 71 years and the youngest 5 years, the occurrence of the disease being most frequent in patients of the ages between 11 and 40. Of the commonly recognized clinical types, the distribution was as follows: anesthetic type 50 cases, nodular type 22 cases and macular type 12 cases. The incidence of alopecia leprosa was extremely low. There is no specific remedy in the ancient Chinese pharmacopeia. The author investigated the available therapeutic management of leprosy among the local practitioners of medicine and reports that in this field competent physicians are extremely rare. He expresses the opinion that a more adequate control and treatment of the disease is urgent if the number of lepers is to be reduced to the minimal level. He advocates institutional care of all patients with active leprosy.

Med. v. d. Dienst. d. Volksgez. in Nederl.-Indië Batavia

30:1-110 (No. ½) 1941. Partial Index

*A Live Plague Vaccine and the Results. L. Otten.—p. 61.

Live Plague Vaccine.—Otten, of the Pasteur Institute at Bandoeng, Java, who has studied plague immunization for more than ten years, says that opinions are divided about the potency of dead plague vaccines. After he had become convinced that it is impossible to stimulate satisfactory immunity in rats and guinea pigs by means of killed bacilli he decided to use a live vaccine. His investigations in this direction were hastened by the chance discovery of a strain that had lost its virulence completely. The favorable results obtained with a live, avirulent variant of the plague strain "Tjiwidej" in the immunization of rats and guinea pigs induced him to investigate to what extent these might also be obtained in man. He demonstrates that, according to the technic he used, the finding of avirulent variants of plague strains involves no particular difficulties and that neither the production nor the application of live plague vaccine involves unpleasant surprises or dangers. During the five years from 1935 to 1939 he employed the live vaccine in a vaccination campaign which extended to more than two and a half million subjects and in which nearly ten million vaccinations or revaccinations were done without harmful consequences to the health or life of the population.

Book Notices

Infantile Paralysis: Anterior Poliomyelitis. By Philip Lewin, M.D., F.A.C.S., Associate Professor of Bone and Joint Surgery, Northwestern University Medical School, Chicago. Cloth. Price, \$8. Pp. 372, with 166 illustrations by Harold Laufman, M.D., Philadelphia & London: W. B. Saunders Company, 1941.

This book is well sprinkled with illustrations. There is a large bibliography and a good cross index. It contains chapters on the history of the disease, port of entry and physical examination. The greater part of the book has to do with care of the patient. As with any book, it represents the opinions of the authors only at the moment it was written, and these are often outdated by the time publication occurs. Some weight is given to laboratory data to support the thesis that the port of entry might be considered as of gastrointestinal origin, but little space is given to clinical evidence. The latter is the only clear-cut evidence that has consistently pointed to the fact that the disease could not possibly enter by way of the nose, despite the massive amount of laboratory work done during the last thirty years to prove this thesis. It would seem that more of this type of evidence should be mentioned.

From a physician's point of view the work is a good reference textbook. Its illustrations are easy to comprehend. One might disagree with the statement that there is such a thing as "the time relationships between the systemic phase, the period of passage through the meningeal blood vessels, the lymphatics, and the choroid plexus to the cord. . . ." Perhaps the author did not mean to imply a systemic disease with spread through the meningeal vessels, and so on. One might also disagree with the statement "Bulbar paralysis is only occasionally associated with paralysis of the spinal nerves and muscles." Nor can one agree with the statement that it is much better to keep a patient at home than to send him to a hospital. One might also disagree with the conclusion that convalescent serum should be used in large amounts intravenously and in small amounts intraspinaly. The bald statement that the spinal fluid is an index of progress is only roughly true. Notwithstanding these disagreements and minor errors, the book is complete and contains a valuable appendix and all the practical information that one need know about infantile paralysis. It can be recommended. The remarks on the hypothetic means of dissemination, on the epidemiology and on predisposing factors are interesting. The author is amenable to reasoning. In fact, he states that it is quite possible that treatment might be begun a little bit earlier than heretofore recommended by most orthopedic surgeons.

Operative Surgery Including Anesthesia, Pre- and Postoperative Treatment, Principles of Surgical Technic, Blood Transfusion and Abdominal Surgery. Edited by Frederic W. Bancroft, A.B., M.D., F.A.C.S., Associate Clinical Professor of Surgery, Columbia University, New York. Cloth. Price, \$10. Pp. 1,102, with illustrations. New York & London: D Appleton-Century Company, Incorporated, 1941.

The production of a new work in surgery is an event greeted with critical interest. The mere delineation of a number of operations is not ordinarily sufficient to warrant publication. In many ways this volume justifies itself because of the fresh points of view. A number of distinguished surgeons have collaborated in presenting the various phases of abdominal surgery. The book begins with a large section on anesthesia which is actually the work of six men. The advantages of such a method are obvious, since each man writes about the particular type of anesthetic or other agent in which he is most interested. The disadvantages can be overcome only by firm editorial guidance, so that contradictions and repetitions are eliminated. Furthermore, such an arrangement may permit important omissions. It is questionable whether or not the field of anesthesia is now so complex that one or two skilled and well trained physician anesthesiologists could not present an adequate picture. A more unified presentation would be preferable. Nowhere in the section are the fundamental principles of anesthesia outlined. The physical signs and manifestations of the various planes of anesthesia are not presented or described by any of the six contributors, so that the entire physiologic basis of anesthesiology is omitted.

The division of the section into preanesthetic medication, inhalation, rectal, intravenous, spinal and regional anesthesia is artificial, since no anesthetic is complete without the first, and the latter are frequently combined.

Other sections are concerned with preoperative and postoperative care, blood transfusion, technic, surgery of the mouth, esophagus, peritoneum and the various intra-abdominal organs. Just how surgery of the mouth is related to abdominal surgery is not made clear, and with slightly less objection surgery of the esophagus may be placed in the same category.

The contributions on these subjects, however, are generally satisfactory. In fact, much excellent information may be found on every page. This volume seems to be merely the binding together of a series of monographs. Often tabular material and other minutiae are included by some of the authors which for textbook purpose could well be further digested and condensed. Apparently insufficient effort was made to confine the contributors to their particular fields. Repetitions are numerous and needless. Perhaps fewer collaborators would have prevented some of this waste. For example, while it is conceded that the Ochsner operation for suprahepatic abscess is useful, it need not be described in detail (with the same illustrations) three separate times (pp. 499, 792, 958). Another example is the repeated description of the McBurney incision. Such repetitions probably contribute much more to the cost than to the value of the book.

Surgeons can find much of interest in this book, but unification and elimination of nonessentials would render it more practical.

Die Störungen der Blutgerinnung beim Kinde mit besonderer Berücksichtigung des K-Vitamins und der Neugeborenenpathologie. Von Professor Dr. G. Fanconi, Direktor der Universitätskinderklinik Zürich Boards. Price, 7.20 marks. Pp. 160, with 21 illustrations. Leipzig: Georg Thieme, 1941.

The recent discovery of vitamin K and the impetus it has given to a more intensive study of the problems of blood coagulation has resulted in the publication of concise monographs both in this country and abroad. This condensed presentation first reviews and summarizes the current views on blood coagulation and the methods available for the quantitative study of the various factors. The discussion of the five main factors concerned with disturbed blood coagulability is terse except for hypoprothrombinemia, which receives the major emphasis. The author attempts to evaluate the part that calcium, fibrinogen, thrombokinase (thromboplastin), heparin and prothrombin play in bleeding states in children. Fanconi frankly states that he has never seen a case of bleeding on the basis of insufficiency of fibrinogen and only 1 questionable case in which decrease in calcium may have been a factor. The role of insufficiency of thrombokinase (thromboplastin) is concerned mainly with hemophilia, and the author critically reviews the evidence for and against the current theories. The part that heparin plays in the hemostatic mechanism is next evaluated, and Quick's and Whipple's views are mainly quoted. The subject of hypoprothrombinemia, however, receives the major emphasis in the monograph and is discussed under four main subgroups: (1) hypoprothrombinemia in sprue and celiac disease, (2) hypoprothrombinemia in liver disease, (3) hypoprothrombinemia in the newborn and (4) hypoprothrombinemia of unknown etiology. In the discussion on hemorrhage during the newborn period the author introduces a philosophical conception of extrauterine adaptation or transformation destruction to explain the dissociation of a number of vital functions which occur immediately or during the first four days of life. Whether such a speculative attempt is justified with such meager facts is questioned. The author concludes the monograph with a short summary which is rather generalized, and at the end all of the 47 cases cited are listed under their respective bleeding difficulties. The discussion is well documented with current references, and case reports are freely offered with separate case analyses. The work is concise and well written but, like all monographs on this subject, because of the paucity of conclusive data, leaves many questions unanswered. The work is stimulating and should interest those concerned clinically with the problems of disturbed blood coagulation in children.

Your Personality—Introvert or Extravert? By Virginia Case. Cloth. Price, \$2.50. Pp. 277. New York: Macmillan Company, 1941.

This book represents another of the seemingly endless stream of theoretical psychologic studies that are being written and published for popular consumption. Many unsuccessful or useless attempts have been made to classify people according to type, both physical and psychologic. Although it is true that the descriptive nomenclature now employed to depict certain attitudes in human personality is extremely inadequate, further attempts to describe and clarify these unfortunate classifications only leads to more confusion. The only classifications that can possibly be of any value must be based on a dynamic analysis of the total personality of the individual and not on a descriptive classification of groups. The general public is susceptible to this sort of schematic presentation, and countless pseudo-scientific publications reach the shelves of our book stores and are accepted as valuable contributions to a common understanding of human personality. In addition to the general theme of classification of all peoples into two types, introverts and extroverts, the author introduces apollonian types, archetypes, chemical types, physical types (according to Kretschmer), cycloid types, gregarious types, leptosome types, moody types, flexible types, positive types, schizoid types and Dionysian types as well as types of writers and types of intellects. There is little in this book that is of any value either to the scientific psychologist or to the layman.

Textbook of Bacteriology. By Edwin O. Jordan, Ph.D., and William Burrows, Ph.D., Assistant Professor of Bacteriology, University of Chicago. Thirteenth edition. Cloth. Price, \$6. Pp. 731, with 170 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

Thirty-three years ago, when the first edition of this book was reviewed, THE JOURNAL said that it was destined to occupy a large field of great usefulness. The prophecy has been fulfilled. Long ago the book came to be widely used by medical schools and their graduates and others. Bacteriology is a comparatively young and vigorous science, which is still growing, as evidenced by the numerous editions and the gradual increase in size of the book. After the original author passed away, the twelfth edition was revised by Dr. Burrows, assistant professor of bacteriology at the University of Chicago, where the book originated. Now the cumulative effects through the decades of slowly moving developmental processes indicate the desirability of completely rewriting the book. The present edition has been constructed on a somewhat different basis than its predecessors. The chapters devoted to the highly specialized applied fields, such as soil, industry and dairy bacteriology, have been eliminated and parts of them incorporated together with new material into a chapter on bacterial physiology. A separate chapter has been written on the mechanisms operative in the transmission of infection. The fundamental principles of epidemiology have been developed through consideration of the interaction of host and parasite populations. The subjects of water and milk are considered in terms of the transmission of disease. The subject of immunity is covered in two chapters, one devoted to antigens, antibodies and the chemical basis of immunologic specificity, the other to specific resistance of infectious disease discussed in terms of humeral and cellular immunity and hypersensitivity. The many chapters devoted to the various bacteria include much new material. Consideration of the filtrable viruses has been expanded to two chapters; the first is a general consideration of the properties of viruses, and the second is given over to the virus diseases of man. This edition, like previous ones, has the references to literature at the bottom of the pages rather than in one large bibliography in the back of the book. The index generally is the same, except that now there is no separate index of authors. There is less space between the type on the page than in some previous editions. The style trends more toward technical expressions, making it perhaps a little less clear and crisp. The familiar dark blue of the binding has been changed to dark brown. The price is just double that of the original edition published in 1908, although the number of pages differs by only a hundred and seventy-four. The present author and the publishers have done well indeed in carrying on the tradition of this widely used book.

Martin Luthers Umwelt, Charakter und Psychose sowie die Bedeutung dieser Faktoren für seine Entwicklung und Lehre: Eine historisch-psychiatrische Studie. Von Dr. Med. Paul J. Reiter, Chefarzt der Psychopathenanstalt in Herstedvester. II: Luthers Persönlichkeit. Seelenleben und Krankheitsverlauf. Paper. Price, 35 Danish kroner. Pp. 633, with 17 illustrations. Copenhagen: Ejnar Munksgaard, 1941.

This is a pathography but as unlike the ordinary run of pathographic description as is a newspaper health column compared with a well controlled clinical experiment. After four hundred years Luther's life and character are still subjects of lively controversy, and an analysis of his work and personality in psychopathologic terms calls not only for erudition but in perhaps larger measure for courage and tact. The author, well known in the psychiatric field, possesses all three qualifications. It takes tact to discuss from the point of view of psychosis or psychoneurosis the inner conflicts and outer struggles of an idol worshiped by hundreds of millions and to maintain an objective approach, indulging neither in condemnation nor in justification. It takes both tact and courage to argue the delicate question whether or not excessive masturbation, intemperance or a possible syphilitic infection might have influenced Luther's life and teaching. By applying a strictly clinical method of dealing with the source material, Reiter has skillfully avoided the pitfalls of partisanship and sensationalism. After extensive differential diagnostic consideration, the final verdict is offered that the great reformer suffered from a manic-depressive condition. The possibilities of a neurasthenia or a schizophrenic or epileptic psychosis are discarded. The book is a mine of psychiatric knowledge with illuminating discussions on specific syndromes and general diagnostic issues, particularly those of temper, character and total personality. The literature is ably covered, the index is neatly arranged and the beautiful illustrations are well chosen. The volume is recommended to psychiatrists as instructive and stimulating reading.

Essentials of Pharmacology and Materia Medica for Nurses. By Albert J. Gilbert M.D., Instructor of Pharmacology, Aultman School of Nursing, Canton, Ohio, and Selma Moody, R.N., Instructor in Nursing Arts, The Presbyterian Hospital of the City of Chicago. Cloth. Price, \$2.25. Pp. 251, with 15 illustrations. St. Louis: C. V. Mosby Company, 1941.

This little book is a placebo: something to soothe the student nurse and entirely without stimulating properties. It is harmless to the extent that it will do no active damage but potentially harmful, for it may leave the baneful impression that it contains the subject matter of a course in pharmacology and materia medica. The course in nursing allocates about thirty hours to this subject. It is a short period, and too much should not be attempted. However, nurses have opportunity to see drugs and their effects, which should be the equivalent of added hours. Student nurses are graduates of high schools and have been accustomed to educational methods. They should be able to assimilate much more pharmacology and materia medica than is presented in this book of "essentials." The object stated is to present the facts and theories of the subject in a lucid, concise form adapted to the limited time for the course in many nursing schools. The book is clear in statement but too dogmatic, as short statements are apt to be. It would seem better pedagogy to include more information, which would save the student's time in looking for it elsewhere and leave to the judgment of the teacher the amount and range demanded.

A Practical Manual of Diseases of the Chest. By Maurice Davidson, M.A., M.D., F.R.C.P., Physician to the Brompton Hospital for Consumption and Diseases of the Chest, London. Second edition. Cloth. Price, \$13.50. Pp. 575, with 200 illustrations. New York & London: Oxford University Press, 1941.

The purpose of this volume is to make available to the internist or general practitioner for the purposes of reference a textbook on diseases of the chest but not including the heart. As the author states, "The exhaustive treatise, of vast dimensions, is too unwieldy to serve the busy practitioner; the small manual, of which there are several excellent examples, can make no pretence to be a standard of reference for those whose studies call for deeper research into the literature and pathology of the conditions dealt with. The present volume represents an attempt to supply a *via media* between these two paths." This book accomplishes the purpose fairly well. Appended to the various discussions are references dealing more exhaustively

with the various subjects discussed. The salient features of the usually encountered diseases are adequately covered and beautifully illustrated by numerous roentgenograms. Since the volume is intended primarily for physicians interested in the general field of medicine, one would welcome more extensive discussion of differential diagnosis. Particular attention is devoted to treatment, stressing particularly the practical aspects. The statement that, aside from the emergency use of bleeding for venous distention and cyanosis, "we are of the opinion that an initial venesection (in the first two days) and removal of at least 10 ounces of blood in a full blooded patient with pneumonia is a good practice and one likely to lessen the tendency to cyanosis and undue respiratory embarrassment" would not find general agreement in this country. Proprietary preparations are given undue prominence. The rapidity with which our knowledge has progressed with regard to chemotherapy is shown by the fact that the section on drug treatment of pneumonia is already somewhat obsolete and incomplete.

Untersuchungen über die Tetryl-, Tetryl- und Knallquecksilber-vergiftungen bei den Arbeitern der Munitionsfabriken Finnlands. Von Leo Noro. *Acta medica Scandinavica. Supplementum CXX.* Paper. Pp. 95, with 7 illustrations. Helsingfors: Mercators Tryckeri, 1941.

Five years ago any publication from Finland on the toxic properties of then little known complex munition chemicals would have commanded scant attention. Today, contrariwise, this publication is of immediate significance for all physicians, chemists and engineers concerned with munitions. With arsenals springing up all over the country it becomes conceivable that "tetryl poisoning" may become as close to all physicians as the omnipresent carbon monoxide poisoning. Written in the summer and fall of 1940 by a battalion physician just after the Finnish-Soviet war, this small publication (in German) presents his observations of the damaging effect on munition workers of numerous aromatic nitro compounds, chiefly tetryl and tetryl, and the substance better known in this country as mercury fulminate. In addition to his own observations from laboratory, clinical and necropsy material, the author furnishes critical literature appraisals and an extensive literature compilation. Noro's results are not in keeping with the observations of other scientific workers in Europe on other war materials that hours of labor are outstandingly important to the incidence of industrial poisoning, but instead this work attaches prime significance to individual susceptibility calling for especial care in the selection of this class of munition workers. No less, Noro repeatedly stresses the significance of the hygiene of work places as an essence of national defense. Implied throughout the book is the concept that the immediate havoc of war is not limited to those directly attacked but may include men and women far from battle fronts and bombed areas who may be engaged in the manufacture or handling of explosive substances.

Vision: A Study of Its Basis. By S. Howard Bartley. With an Historical Perspective. By Edwin G. Boring. Cloth. Price, \$3.50. Pp. 350, with 78 illustrations. New York: D. Van Nostrand Company, Inc., 1941.

This work is admittedly a handbook on the subject of vision. As such it is reasonably comprehensive, although in some few instances clarity is sacrificed for the sake of brevity. The book is well documented, the references including most of the recent works that are covered in the discussion. The author approaches the entire subject in an orderly and logical fashion, considering first the fundamentals of physiologic optics with particular reference to the entoptic phenomena in relation to their effect on the neurophysiology of the perceptive units. From this the author proceeds to the topic of neurohistology of the perceptive elements and finally to the neurophysiology of all the elements involved in the visual pathway. It is to the last named subject that the author devotes most of his discussion with chapters on repeated stimulation (flicker), perception of movement, adaptation phenomena, neural interaction and contour. Discussion of the optic pathways and the cortical response are followed by an excellent conclusion in which the author points out the road that has already been traveled in attempting to elucidate this subject and what remains to be done. Unfortunately the author has considered the realm of color vision to be outside the scope of this book and has therefore left out any reference to this phase of the subject.

Die Methoden der Fermentforschung. Unter Mitarbeit von Fachge-nossen. Herausgegeben von Prof. Dr. Eugen Bamann und Prof. Dr. Karl Myrbäck. Lieferung 8. Paper. Price, 34.50 marks. Pp. 2589-3047, with 86 illustrations. Leipzig: Georg Thieme, 1941.

This is a continuation and the completion of the text of a large work on methods of investigating enzymes. The bibliography and index still remain to be published. The contents of the present volume begin with page 2589. The general subject matter includes: Aspartase by Jorma Erkama and A. I. Virtanen, Helsinki. Peroxydase and catalase by Karl Zeile, Göttingen. Hydrogenase by M. Stephenson and D. D. Woods, Cambridge, England. Reducing substances of unknown mechanism: the thiol disulfide system by Theodor Bersin, Marburg. ascorbic acid by Peter Holtz, Rostock, and quinone bodies by F. Lynen, Munich. Assimilation: carbon dioxide by M. Steiner, Göttingen, and Horst Engel, Münster, nitrogen by A. Virtanen and Tauno Laine, Helsinki. Antienzymes by J. B. Sumner, Ithaca, N. Y. Ferment models by Wolfgang Langenbeck, Dresden. The enzymes of the industries: brewing by Hugo Haehn, Berlin; fat by Emil Hoyer, Rostock; malt extract by S. Preiz, Breslau; baking by H. Thaler, Munich. The distribution of authorship gives an international tone to the work, clearly of a special nature but valuable to research workers in many phases of biology. Since fermentation enters into so many phases of the kinetics of life, it is practically synonymous with life itself. As a type of the detailed inclusiveness of the work, we may select the first subject, aspartase. The treatment of this includes the naming of the enzyme, its occurrence in micro-organisms, plant and animal tissues; its preparation, purification, experiments on its action, and the products formed; the substrate; specificity; isolation and determination of the reaction products; kinetics of action; obtainability; aspartase as a reagent in the estimation of aspartic acid. This work has a place in every laboratory interested in fermentation. It should be more valuable when the index and references are published.

Essays on the Applied Physiology of the Nose. By Arthur W. Proetz, A.B., M.D., Professor of Clinical Otolaryngology in the Washington University School of Medicine, St. Louis. Cloth. Price, \$7. Pp. 395, with 91 illustrations. St. Louis: Annals Publishing Company, 1941.

There is no doubt that any contribution which is intended to correlate our past and present knowledge of the physiology of the nose and sinuses is a welcome addition to a trend which has brought this field to the forefront. This monograph should serve as a challenge to workers who are interested in the field of nasal physiology to produce a definitive work. The author himself has this feeling, for in his introduction he regards his own preparation for the basic field as inadequate and offers instead a "lifetime of clinical experience" and "an absorbing interest." The author draws a corollary between the progress made by the studies in nasal pathology; he felt that if he wanted to read a specialized book on nasal physiology he would have to write it himself. The book, of twenty-one chapters, gives a sketchy outline of some of the historical contributions to this special field. On the basis of what is now known regarding ciliary action and its response to various agents, Proetz also gives an applied physiology. The structure of the nose and its relationship to function, olfaction, air currents and pressure, humidification, the mucosa as a defensive structure, vascular, lymphatic and neural reactions, are all discussed in a simple terse style based on the author's own contributions and those contained in the literature. An attempt is made with a modicum of success to correlate the commonly employed types of nasal surgery and medical treatment to the basic physiology. A universal appreciation of this principle could have a far reaching effect on the general tendency for indiscriminate intranasal medical and surgical therapy. Proetz's pioneering effort presages a constructive era in rhinology.

The Conquest of Bacteria from 606 to 693. By F. Sherwood Taylor, Ph.D., M.A., B.Sc. Second edition. Cloth. Price, 6s. Pp. 144. London: Seeker & Warburg, 1940.

This is a record of the historical development of the measures by which the conquest of bacteria has thus far been achieved. Intended for the layman, it is to be commended for its scientific soundness and interesting style. It achieves its purpose without resort to melodramatic distortions. Since the volume was written in England by an Englishman during the present war, American contributions to modern chemotherapy have been

almost entirely ignored. But an otherwise excellent account of sulfanilamide and sulfapyridine does not even refer to the work of Perrin H. Long or of any other American investigator. The author also creates the impression that the new chemotherapy was not warmly welcomed in America because of the "elixir of sulfanilamide" incident, which was certainly not the case. With respect to sulfapyridine in pneumonia, the author expresses the pious hope (in 1940) "that the new treatment will completely establish itself within a year or so" in the United States.

Abdominal Surgery of Infancy and Childhood. By William E. Ladd, M.D., F.A.C.S., William E. Ladd Professor of Child Surgery at Harvard Medical School, Boston, and Robert E. Gross, M.D., Associate in Surgery, the Harvard Medical School. Cloth. Price, \$10. Pp. 455, with 268 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

Without doubt this is a predestined classic in its field. Abdominal surgery of children has long been regarded as difficult but, in spite of remarkable results, has been retarded by an excessive operative mortality. So much satisfaction can be attained by various surgical procedures that special attention to improve operative mortality is more than warranted. In this endeavor the senior author has long been regarded as a leader. An excellent chapter on congenital pyloric stenosis is first in the book. The various infantile and congenital disorders of the alimentary tract and its auxiliaries follow. The volume concludes with a fairly complete discussion of diseases of the male and female urogenital tracts. However, malformations associated with hypospadias are not included. Many fine photographs and drawings are included which represent chiefly the experiences of the authors and the techniques they use. Statistical data and frank statements concerning the actual risk and value of various operations are an important feature. Any active abdominal surgeon should be able to perform many of the procedures described, since he is likely to possess the consummate skill and speed in operating demanded by surgery in infants.

Following a Doctor's Satchel: An M.D. Talks from Fifty Years Experience. By A. O. Scarborough, M.D. Cloth. Price, \$1. Pp. 96, with portrait. Grand Rapids: Wm. B. Eerdmans Publishing Co., 1941.

Unlike most books written by venerable physicians, this one is not an autobiography. The author is still practicing medicine in a small city in Texas at 80 years of age and he simply wants to pass on the wisdom he has acquired during a long career. His advice is deeply rooted in religious principles. In his short philosophic essays he writes about love of country, paternal love, love of money, pride of ancestry, love of nature, anger, fear, sympathy. He has definite ideas about some more modern problems also. The attempted inroads of politics into the practice of medicine he has found to be very undesirable. He believes that the rise of the cults today can be explained by the prophecies in the Bible, which told us that the time would come when people would not endure sound doctrines but would run off after fables. Younger people might spend an hour, which is about all it takes to read the book, with the kindly and keen octogenarian. Interest grows as the pages go by. The editor incidentally overlooked some punctuation points, capital letters and long sentences in the opening pages of the book.

The Health and Efficiency of Munition Workers. By H. M. Vernon, M.A., M.D. Cloth. Price, \$2.50. Pp. 138, with 15 illustrations. New York & London: Oxford University Press, 1940.

In this small volume the author gives a brief exposition of England's experience with hours of work, work spells and rest pauses, shift systems, sickness and absenteeism, accidents and injuries, ventilation, heating and lighting of factories, and welfare and labor management in relation to munitions output in the World War and the early days of the present war. Throughout the volume the importance of maintaining the health of the munition workers is emphasized, although he gives no specific methods. He presents a good case, however, for certain limits of productive effort, at which best results in output can be obtained without impairment of health. Appearing on the threshold of our own national defense effort, this book has value to industrial physicians, but more particularly to industrial management.

Sorting Tests in Relation to Drug Therapy in Schizophrenia. By Joseph Zubin, Ph.D., Associate Research Psychologist, New York State Psychiatric Institute, New York, and Jane Thompson, Ph.D., Psychological Assistant, New York State Psychiatric Institute. Paper. Pp. 23. New York, 1941.

This small monograph was undertaken to check the findings of another author regarding a supposed relationship between patients' performances before and after insulin and metrazol shock therapy. The sorting tests were purely psychologic with a statistical analysis. The tests used were the Weigl Color Form, the Vigotsky and the BRL sorting. One hundred and fourteen patients were studied. The conclusions were that the sorting tests showed the existence of a definite relationship between patients' performances before and after shock therapy. There is a good bibliography. This publication is recommended to all psychologists.

Standard Radiographic Positions. By Nancy Davies, M.S.R., Senior Radiographer, Royal Surrey County Hospital, Guildford, and Ursel Isenburt, M.S.R., Radiographer to the Charterhouse Rheumatism Clinic, London. Cloth. Price, \$2. Pp. 136, with 103 illustrations. Baltimore: William Wood & Company, 1941.

This is a little handbook on radiographic positioning, of such size as to fit into the pocket of a coat or gown and intended to serve as a ready reference book for standard radiographic positions. For details of technic of special x-ray examinations the reader is referred to more elaborate books. The illustrations are diagrammatic, only the main structures and outlines being given. In view of the needs of these war days, considerable space is devoted to positions required in the x-ray localization of foreign bodies. In perusing this work one finds little to criticize. It is not a pretentious publication, but it serves well for the purpose intended and should be valuable for radiographic technicians.

Die tägliche gynäkologische Sprechstunde. Von Dr. M. Rodecurt. Cloth. Price, 10.50 marks. Pp. 308, with 3 illustrations. Leipzig: Georg Thieme, 1941.

This book, which is devoted to office gynecology, has nineteen chapters including those dealing with infections of the genitalia, malpositions of the uterus, abnormal uterine bleeding, endocrinology, sterility, habitual abortion, pregnancy, diseases of the breasts, backache, rheumatic-neuritic-neuralgic-vegetative symptom complex, the menopause, cosmetics and sexualia. Some of the chapters are disproportionately large. The one dealing with *Trichomonas* occupies forty pages, or one seventh of the book, whereas only eight pages are devoted to gonorrhea. There are only three illustrations in the entire book, two of which depict *Trichomonas* and the third shows the Knorr instrument, which is used for applying silver nitrate to the bladder in cases of urinary incontinence. The book is well written, but it loses a great deal of its value because of the almost complete lack of illustrations, which are essential for the instruction the author attempts to give.

Necropsy: A Guide for Students of Anatomic Pathology. By Bela Halpert, M.D., Assistant Professor of Pathology and Bacteriology, Louisiana State University School of Medicine, New Orleans. Cloth. Price, \$1.50. Pp. 75. St. Louis: C. V. Mosby Company, 1941.

This brief manual, written primarily for students, describes in a systematic manner the procedure for conducting a necropsy. The anatomy of the organs and their anatomic relationships with associated structures are emphasized in twenty brief sections. No discussion of any pathologic alterations of the organs is attempted. The principles for a complete necropsy record are stated in the appendix. Two sample records including anatomic and microscopic descriptions are given as examples of a representative report. The book is entirely devoid of illustrations. The medical student and intern will find this a handy book for quick reference.

Laboratory Guide in Elementary Bacteriology. By M. S. Marshall. Fabrikoid. Price, \$1.75. Pp. 244. Philadelphia: Blakiston Company, 1941.

This little laboratory guide is designed to serve a course in elementary bacteriology. It is, however, a little astonishing to find listed the nine volume System of Bacteriology and Topley and Wilson's two volume Principles of Bacteriology and Immunity as textbooks for an elementary course. The value of this guide can be determined only under conditions of actual use and will doubtless be found satisfactory for some courses and not for others.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

NAPOLEON'S URETHRAL STRICTURE

To the Editor:—Some years ago in a paper on the history of Napoleon the assertion was made that the battle of Waterloo was lost because Napoleon, on account of a urethral stricture, could not pass his urine. Can you give such information as would lead to a corroboration of this statement?

Edward J. III, M.D., Newark, N. J.

ANSWER.—Dr. Edmund Andrews, in a paper entitled *The Diseases, Death and Autopsy of Napoleon I*, published in *THE JOURNAL*, Dec. 21, 1895, page 1081, presented evidence on which the assertion mentioned in the query may have been based. Andrews in that article quoted Field Marshal Garnett Wolseley, who was at that time (1895) head of the British army, as stating "that at the battle of Waterloo Napoleon suffered pain in riding, and that he had a table set in the open air in a suitable position for receiving dispatches and issuing orders, where he sat for hours, much of the time asleep, leaning his head on his arms." Further in Andrews' article the following sentence appears: "All this terrific labor he accomplished while suffering under a genitourinary disease which may have partly weakened his force of will." Andrews continues: "During the Russian campaign in 1812, Napoleon began to have difficulty in expelling his urine." Andrews states that there can be but little doubt that the trouble was urethral stricture with cystitis. He says that the sequence of events seems to have been (1) an attack of gonorrhea, (2) a stricture of the urethra, (3) a cystitis, (4) nephritis with a few small calculi and (5) albuminuria, dropsy of the legs, and uremic poisoning in a moderate degree.

FAMILIAL TREMOR

To the Editor:—A woman aged 54 has had intention tremor of the head and hands since childhood. Her father, one sister out of a family of eight, and several cousins have all had the same tremor, although to a lesser degree. The tremor becomes much worse under stress and strain and almost completely disappears when she is at rest. I have tried 1.200 grain (0.0003 Gm.) of scopolamine three times daily without success. One and one-half grains (0.1 Gm.) of phenobarbital at a time gives only slight relaxation and does not make her at all drowsy. Alcohol is the only drug which will give her complete, although temporary, relaxation. After she has drunk about half a cocktail her hand will become so steady that she can lift the glass without spilling any liquid. At other times she has to drink through a straw. Can you tell me of any other drug which will have a similar reaction?

Elizabeth Brakeley, M.D., Montclair, N. J.

ANSWER.—There is no drug as useful as alcohol in abolishing a familial tremor. The effect, however, is temporary and this method of therapy cannot be used in a routine manner.

Not many experiments have been made on tremors of the familial kind, but there is a large literature with regard to the effect of drugs on the tremors of parkinsonism, either of the postencephalitic or of the paralysis agitans type. Ziskind (*THE JOURNAL*, July 3, 1937, p. 20) has shown that phenobarbital tends to increase the rigidity of chronic encephalitic parkinsonism, and Friedman's work (*Bull. Los Angeles Neurol. Soc.* 5:120 [June] 1940) indicates that the same drug decreases the steadiness and increases the tremor. Scopolamine has long been recognized as a drug having the effect of releasing the rigidity of paralysis agitans but at the same time making the tremor worse either through the lessening of the rigidity or by some direct action on the nervous mechanism. Neither phenobarbital nor scopolamine would seem likely, therefore, to be of value in controlling a familial tremor.

The occurrence of tremors in animals deprived of vitamin E, as shown by Mackenzie (*Proc. Soc. Exper. Biol. & Med.* 44:95 [May] 1940), has led to the use of alpha-tocopherol in patients suffering from tremors of various types. The results, so far as known, have not been beneficial, but no published series has yet appeared in the literature. This method of treatment is worthy of further trial, although the outlook for a favorable result is not good.

A more promising field lies in the use of the belladonna alkaloids. Raef, a Bulgarian plant collector, was first to use the extract of belladonna root in 1926, and the treatment of

parkinsonism by this method was intensively studied in Italy by Panegrossi (*Policlinico [sez. prat.]* 42:46 [Jan. 14] 506, [March 18] 1935). The results were uniformly good both in Italy and in Germany. The preparation used was a white wine extract of the whole belladonna root. Later American, English and Italian belladonna root was substituted for the original Bulgarian product with equally good results. The extract is not well tolerated by the aged, the arteriosclerotic or the alcoholic. Toxic symptoms in other groups of patients are rarely seen.

From the work with belladonna root in parkinsonism, it was concluded that the therapeutic effect of the belladonna alkaloids is increased when they are given in combination, as in an extract of the root. When the purified alkaloids are extracted and put together in a tablet, the results are equally good, as shown by the work of Gayle and Pettis (*Am. J. Psychiat.* 97:1175 [March] 1941). They used a compound of atropine, scopolamine and hyoscyamine. Their report is based on the treatment of parkinsonism alone, without cases of familial tremor. The results were striking and the combined drugs were not dangerous, with ordinary precautions, to use. Riebold (*München. med. Wchnschr.* 87:1183 [Oct. 25] 1940) reports one case of familial tremor treated with the belladonna root extract, with surprisingly good results. Either the extract or the compound tablet may be tried, therefore, in this case.

EXFOLIATIVE DERMATITIS AND ALOPECIA

To the Editor:—A man aged 24 complains of complete loss of hair of the scalp and inability to sweat, except on the hands and face. He suffers extremely during the summer months and can hardly do any work. He had a skin condition two and one-half years ago, at which time his skin peeled off several times over a period of four months and during which he lost all his hair. (This sounds like an exfoliative dermatitis.) Following this he began having trouble with his sweat glands. Physical examination and laboratory tests are negative. Examination of the skin reveals the hands and face to be moist. The rest of the skin is extremely dry. What is this condition? Is there any treatment for it? Would a biopsy of the skin give any information?

M.D., South Dakota.

ANSWER.—The man probably had an exfoliative dermatitis, a symptom complex which may be due to divers causes. The history is not sufficiently informative to differentiate among these several causes. The primary or type of Wilson-Brocq exfoliates with large scales over a prolonged period and is accompanied with few constitutional symptoms. The inference is that this man's exfoliative dermatitis did not last long. The secondary type of exfoliative dermatitis appears as a complication of some preexisting eruption such as psoriasis, lichen planus or pityriasis rubra pilaris, which has been too strenuously treated or which has spread, to become universal. The history does not mention anything about a preceding eruption. Pityriasis rubra of Hebra exfoliates with fine branny scales; the skin becomes pigmented and bronzed and atrophic. This is supposedly on a tuberculous basis, but some patients who have had this dermatitis are known to have developed frank leukemia. This entity too is long lasting and would not seem from the history to have been present. One of the several members of the lymphoblastoma group—leukemia, Hodgkin's disease, lymphosarcoma and granuloma fungoides—may give rise to exfoliative dermatitis as one of their nonspecific varieties of eruption. Eventually some specific sign of their presence, such as changes in the blood or type of clinical and histologic cutaneous change, makes them recognizable with certainty. This patient would not seem to be suffering from anything in the lymphoblastoma group of diseases. Exfoliative dermatitis may be on a toxic basis, as in idiosyncrasy to one of the arsphenamines.

The complete loss of scalp hair dating from the time of the exfoliative dermatitis may be assumed to have been part of the latter process. Loss of hair and nails not uncommonly occurs with exfoliative dermatitis. It is usual, however, for the hair to regrow. The history does not mention anything with regard to other hair than on the scalp. There is a possibility that the loss of hair may be an extensive alopecia areata. In this, one would expect the hair at other sites than the scalp to be affected.

Alopecia areata is a somewhat attractive diagnosis, because in it there is supposedly present a functional imbalance or disorder of the vegetative nervous system. This seems a probability here because of the excessive sweating of the palms. Excessive sweating may be due to debilitated states and toxic processes, but in such cases it is more generalized. In hyperhidrosis due to organic nervous changes, the sites may be localized but are not apt to be symmetrical as is the fact with

this patient. Excessive perspiration of the palms and soles commonly accompanies emotional tension. Sweating may be induced by direct or pharmacologic stimulation of components of the vegetative nervous system and, contrariwise, diminished or absence of sweat secretion follows their depression.

The probability exists that the patient has some functional nervous disorder. The services of a neuropsychiatrist would be valuable. The patient should be reinvestigated to rule out some source of toxemia or endocrinal change. Can anything abnormal be found with regard to the pituitary body by roentgen ray examination? If nothing definite can be found to account for the patient's troubles, certain empirical and symptomatic agents may be useful.

The patient should be withdrawn from an environment and situations which increase emotional tension. Certain drugs may be helpful, such as the use of antispasmodics. Thyroid may be cautiously tried. For excessive sweating of the palms and soles, roentgen therapy, one-fourth unit at weekly intervals for four doses, may be helpful. For the same also application of 25 per cent aluminum chloride in aqueous solution each night for ten days and then twice a week thereafter. For the anhidrosis of the body, the cautious use of pilocarpine is indicated. Keeping the patient in a cool environment is necessary to prevent discomfort and even danger. A course of ultraviolet exposures to the scalp is one indication for the alopecia. Another method is the use of direct stimulants such as the application at weekly intervals of Cutler's fluid (equal parts of chloral hydrate, phenol and tincture of iodine), but if skin irritation appears it must be promptly discontinued.

PYORRHEA ALVEOLARIS AND ARTHRITIS

To the Editor:—At the various symposiums on infectious arthritis which I have attended during the past several years, the consensus seemed to be that pyorrhea could not be regarded as a contributing focus of infection. I have been advised that some of the leading dental schools feel that this is a mistaken assumption. They believe that this infection is picked up by the lymphatics and is thus carried through the system and that, furthermore, the more modern treatments of pyorrhea block the lymphatic drainage from affected areas and thus prevent additional absorption. Please comment on these views.

Robert Hoffman, M.D., South Bend, Ind.

ANSWER.—It is assumed that by the term "infectious arthritis" the writer is referring to the so-called chronic non-specific infectious or rheumatoid (atrophic) arthritis. Despite the enormous amount of work done during the past seventy-five years to prove the microbic theory of rheumatoid arthritis, the cause of this disease is still unknown. It has not yet been definitely established that the disease is due to bacteria or even to bacterial toxins, nor has the role of infected foci been accurately determined. In the United States the majority of students of the rheumatic diseases are withdrawing from their former attitude of zealous adherence to the old idea that infected foci were a frequent cause of arthritis and that the removal of such infected foci could be expected to modify notably the course of the disease. The pendulum has swung away from the theory of focal infection simply because the results from the removal of various infected foci have been in the main so disappointing. Indeed, one of the prominent former advocates of removal of infected foci recently has stated that "The time has arrived for a complete reevaluation of the focal infection theory. Undoubtedly there are cases of infectious arthritis which result from focal infection. However, as far as typical rheumatoid arthritis is concerned, it would appear that chronic focal infection plays a comparatively unimportant role" (Cecil, R. L., and Angevine, D. M.: *Ann. Int. Med.* 12: 577 [Nov.] 1938). One view is that many infected foci may be the result, not the cause, of the disease; that is, that as the result of the general debilitating effect of rheumatoid arthritis the whole body is "run down," the general resistance of various tissues is lowered and, in some tissues which have become seats of lessened resistance, focal infections may develop secondarily (Pemberton, Ralph: *J. Bone & Joint Surg.* 53:879 [Oct.] 1935).

Infected teeth and pyorrhea are commonly found on examination of patients with rheumatoid arthritis, but they are also commonly found on examination of nonarthritic persons and of patients with forms of chronic arthritis (for example, osteoarthritis) not considered infective in nature. The majority of physicians and dentists have considered periapical infections more potent foci than gingivitis or pyorrhea. But representative of another view is the belief of J. V. Cogan that gingivitis is more important than periapical infection in cases of chronic arthritis and that such gingivitis requires special dental therapy

and not just cleaning (*J. Am. Dent. A.* 26:56 [Jan.] 1939). In contrast with this opinion is that of another student of rheumatic diseases who considered gingivitis "unimportant" and root abscesses "greatly overrated as a source of arthritis" (Monroe, R. T.: *Oxford Loose-Leaf Medicine*, Oxford University Press, 1939, chapter 15, pp. 367-404).

In support of the idea that gingivitis may play a role in the production of chronic arthritis can be mentioned the work of Cook and Stafne (*Dental Cosmos*, February 1939), who recovered organisms, chiefly *Streptococcus viridans*, from deep pyorrhea pockets of patients who had "chronic infectious arthritis" and, by injecting them intravenously into rabbits, were able to produce acute purulent arthritis in the rabbits, from the joints of which *Streptococcus viridans* was readily recovered. But in interpreting these results it must be noted that the articular lesions (acute purulent) in the animals did not resemble the chronic nonsuppurative lesions of the patients studied. Such experimental studies will be difficult to interpret until some characteristic bacteria or bacterial toxin can be consistently isolated from the joints or blood stream of patients who have rheumatoid arthritis or at least until the course of rheumatoid arthritis can be shown to be more significantly and more frequently modified by the removal of infected foci than has been shown to date.

The present attitude of most American rheumatologists is that arthritic patients with infected foci are certainly "less fortunate" than those without infected foci. Infected foci, including gingivitis, may well be harmful to the arthritic patient in a general way, if not in a specific way; hence their eradication is indicated, but no promises should be made that the articular disease will be notably altered thereby.

Much can be accomplished in the treatment of teeth affected with pyorrhea if the situation is recognized early before too much of the supporting tissues have become involved.

Treatment consists in thorough cleaning of the teeth, polishing of the exposed root surfaces, elimination of deep pockets and hypertrophied tissue and correction of traumatic factors. The patient should be instructed with regard to the necessity and importance of dental hygiene.

Generally speaking, if two thirds of the bony support of the single rooted anterior teeth is lost, or if the bifurcation or trifurcation of the multirooted teeth is exposed, the general practitioner should consider these teeth beyond treatment and they should be removed.

TREATMENT OF DEMENTIA PARALYTICA

To the Editor:—Should a middle aged patient with dementia paralytica whose serologic reaction has become negative after antisyphilitic treatment but whose clinical picture shows deterioration in spite of the negative serology be continued with treatment? Opinion seems to differ. According to the Vienna school one should keep on treating and one should go by the clinical picture rather than by the serologic findings. However, it seems that according to certain American schools of thought one would stop treating a patient such as the one mentioned.

M.D., Iowa.

ANSWER.—The answer to this question depends on whether the patient has already received fever therapy, preferably with malaria. If so, the situation is as summed up by Moore (*The Modern Treatment of Syphilis*, ed. 2, Springfield, Ill., Charles C. Thomas, 1941, p. 443): "Though improvement in the mental status may occur actually during the course of fever, it may also be delayed for several weeks or months. Worldwide experience has demonstrated, however, that if a change for the better does not appear within six months it probably will not occur at all. If malaria and the appropriate after-treatment have been unsuccessful in effecting any betterment during this period of time, the chance of obtaining it from any form of treatment, even including a second trial of fever therapy, is so small as to make further therapeutic efforts unjustifiable unless the family's finances are almost unlimited." This applies, however, only to malaria-treated paretics. If malaria has not already been employed for a patient such as the one described, it should be given a trial.

SULFHEMOGLOBINEMIA AND TUMOR GROWTH

To the Editor:—I have observed some cases in which sulfhemoglobinemia has seemed to retard the growth of malignant tumors and to make such tumors more sensitive to roentgen rays. I would like to have an informed opinion on this observation; furthermore, I would appreciate any reference to the literature.

M.D., Indiana.

ANSWER.—So far as is known there is no evidence that sulfhemoglobinemia retards the growth of tumors or renders them more sensitive to roentgen rays.

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THE "ANOXEMIA TEST" AS AN INDEX OF THE CORONARY RESERVE

SERIAL OBSERVATIONS ON ONE HUNDRED AND
THIRTY-SEVEN PATIENTS WITH THEIR APPLI-
CATION TO THE DETECTION AND CLINICAL
COURSE OF CORONARY INSUFFICIENCY

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The "anoxemia test," together with its clinical applications and limitations, has already been described in detail.¹ In principle it consists of permitting the patient to breathe a mixture of 10 per cent oxygen and 90 per cent nitrogen for twenty minutes or until cardiac pain appears. Measurements of electrocardiograms taken at intervals during this period reveal in patients with a diminished coronary reserve characteristic changes which are not observed in the presence of an adequate coronary blood flow. The occurrence of pain during the test has not been stressed as a diagnostic feature, because it represents a subjective reaction. In this respect, the present study appears to call for a modification in the point of view. The observations here reported were designed to furnish information concerning the value of a series of tests done over a period of time on the same patients, with particular reference to the diagnosis and the clinical course of coronary insufficiency.

MATERIAL AND METHOD

The group studied comprised 137 persons, on whom the test was performed 373 times. The duration of follow-up study ranged from six to thirty-nine months, with an average of twenty-one months. On 120 patients the test was done at least twice and on some as often as twenty times. The patients were classified according to the clinical diagnosis made before the initial test was carried out. In the control group were 25 "normal" persons, who did not have symptoms or signs of cardiac disease. Twenty-four patients were suspected of having coronary artery disease, chiefly because

of the complaint of cardiac pain, although no signs of heart disease were found. Sixty-seven patients had coronary sclerosis. This diagnosis was established by the presence of cardiac enlargement, an abnormal electrocardiogram or both. Many, but not all, of the 67 complained of anginal pain. In 45 no infarction was believed to have occurred; in 22 healed infarcts were known to be present. Ten had hypertension with no clinical evidence of coronary involvement. Among 11 patients with miscellaneous conditions 5 had rheumatic heart disease, 3 syphilitic aortitis and aortic insufficiency, 2 severe anemia and 1 acute pericarditis, probably of rheumatic origin (table 1).

Twenty-three patients died during the follow-up period, 15 of heart disease. In 11 of the 15 death was "acute"; that is, it occurred either suddenly or within a few weeks after an attack of coronary occlusion; in 4 it was due to congestive heart failure. Eight patients died of causes other than cardiac disease.

There were 96 men and 41 women; 123 were white and 14 Negro. In age the patients ranged from 20 to 79 years. The control group included persons from 31 to 77. There was no patient with coronary sclerosis under 40.

The data in each case were transferred to forms designed for the purpose, and a detailed statistical analysis was then carried out.² Only selected aspects of this study are here presented.

The test was performed as previously described, the criteria of a positive reaction being as follows:³

1. The arithmetical sum of the RS-T deviations in all four leads (1, 2, 3 and 4 F) totals 3 mm. or more.
2. There is partial or complete reversal of the direction of the T wave in lead 1, accompanied by an RS-T deviation of 1 mm. or more in this lead.
3. There is complete reversal of the direction of the T wave in lead 4 F, regardless of RS-T deviation.
4. There is partial reversal of the direction of the T wave in lead 4 F, accompanied by an RS-T deviation of 1 mm. or more in this lead.

The test should not be performed in the presence of congestive heart failure, within four months after known cardiac infarction or on the same patient more than once in twenty-four hours. If these precautions are observed, serious reactions may be avoided.

RESULTS OF FOLLOW-UP STUDY

"Normal" Patients.—There were 25 in this group, all without symptoms or signs of cardiac disease. None showed a positive result or died of cardiac disease. During the course of observation 2 died of cancer and 1 of pulmonary tuberculosis.

This investigation was aided by a grant from the Josiah Macy Jr. Foundation.

From the Department of Medicine, Columbia University College of Physicians and Surgeons, and the Medical Clinic of the Presbyterian Hospital.

Read before the joint meeting of the Section on Practice of Medicine and the Section on Pharmacology and Therapeutics at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Levy, R. L.; Bruenn, H. G., and Russell, N. G., Jr.: The Use of Electrocardiographic Changes Caused by Induced Anoxemia as a Test for Coronary Insufficiency, *Am. J. M. Sc.* 197: 241 (Feb.) 1939. Levy, Williams, Bruenn and Carr.²

2. Miss Dorothy Kurtz, Supervisor of the Record Department of the Presbyterian Hospital, aided in making the statistical analysis.

3. Levy, R. L.; Williams, N. E.; Bruenn, H. G., and Carr, H. A.: The "Anoxemia Test" in the Diagnosis of Coronary Insufficiency, *Am Heart J.* 21: 634 (May) 1941.

Patients with Suspected Coronary Sclerosis.—There were 24 in this group. A positive reaction was observed in 3; in 2 of these the reaction subsequently became negative. None had pulmonary edema or congestive heart failure. In 1 death from acute cardiac disease occurred. In 21 patients the reaction was negative; in 1 of these it became positive. None in the course of the study had coronary occlusion, pulmonary edema or congestive heart failure.

Patients with Coronary Sclerosis.—There were 67 in this group. The reaction was positive in 30; in 11 of these it later became negative. In 6 of the 11 in whom a negative reaction was later observed pain occurred during induced anoxemia. Coronary occlusion, pulmonary edema and congestive failure each were observed once during the follow-up period. Four patients died of acute cardiac disease; 5 died of causes other than heart disease. In 37 the reaction was negative; in 14 of these, pain occurred during the test. Of the 37, 10 later showed a positive reaction, and of these 10, pain had appeared in 4 when the reaction was negative. Coronary occlusion and congestive failure each occurred once. Three patients died of acute cardiac disease; 2 died of causes other than cardiac disease.

TABLE 1—Material

Number of patients	137
Number of tests	272
Duration of follow up study, 6 to 39 months (average, 21)	
Clinical diagnoses	
Person normal	25
Suspected coronary sclerosis	24
Coronary sclerosis	67
No known infarction	45
Healed infarction	22
Hypertension	10
	11
Anemia	1
Pericarditis	1

Patients with Hypertension.—There were 10 in this group. The reaction was positive in only 1, in whom it remained so throughout the period of observation. This patient had no complications and survived. In 9 the reaction was negative. One of these later showed a positive reaction. One subsequently had congestive failure and survived. Four died of congestive failure.

Miscellaneous Patients.—There were 11 in this group. The reaction was positive in 2. One later showed a negative reaction, and pain occurred during the test. There were no later complications. Nine showed a negative reaction which in 1 later became positive. Two patients, both of whom had aortic insufficiency, died of acute cardiac disease; in both, although the reaction was negative, the test caused pain.

UNPLEASANT SYMPTOMS AND REACTIONS

On a number of occasions unpleasant symptoms occurred during the test but did not interfere with its completion. These were dizziness, headache, palpitation and irregular breathing. Unpleasant reactions which required termination of the test were observed eighteen times in 12 patients (table 2). Of these, vasovagal attacks were the most frequent and were observed eight times in 6 patients. In 3 patients on five occasions a state of panic developed. There was loss of consciousness twice in the same person, but curiously enough there was no change in either pulse rate or blood pressure. Consciousness returned in about one minute after 100 per cent oxygen was administered. Dyspnea was observed twice in 1 patient.

Though the dyspnea was not severe, it was deemed wise to terminate the observation. Pulmonary edema occurred once during a test done in November 1938, when the work was in its early stages. This is one of three similar reactions already reported.¹ Since we have observed the simple precautions already outlined, there has been no repetition of this disturbance.

TABLE 2—Unpleasant Reactions Which Required Termination of Test

Type of Reaction	Number of Times Observed	Number of Patients in Whom Reaction Occurred
Vasovagal attack	8	6
Panic	5	3
Loss of consciousness *	2	1
Dyspnea	2	1
Pulmonary edema †	1	1

* No change in pulse rate or blood pressure

† Occurred in November 1938, during the early stage of the work

It is our considered judgment that the test is safe for clinical use if properly performed. In the past four years it has been done in our laboratory 1,024 times on 442 persons. Unpleasant reactions have been observed forty-six times in 36 patients. There have been no serious effects; and repeated tests have not in any patient affected unfavorably the course of his disease.

SIGNIFICANCE OF A NEGATIVE REACTION WITH PAIN

In our previous studies importance was attached only to changes in the form of the electrocardiogram caused by induced anoxemia. This attitude was adopted because it was believed that pain, being a subjective reaction, might be an unreliable indicator. Patients vary in their susceptibility to painful stimuli, and in a few who are malingerers the result may be misleading. Certainly a method which is objective is preferable. In analyzing the present series, however, we were struck by the fact that in patients with coronary sclerosis who experienced pain during the test, even though no significant changes appeared in the electrocardiograms,

TABLE 3—Results of Test in Relation to Clinical Course in Sixty-Seven Patients with Coronary Sclerosis

Result of First Test	Number of Cases	Result of Follow Up Test Positive		Complications During Period of Observation *	Deaths	Complications + Deaths	
		Number	Percentage			Number	Percentage
Positive	30	19	63.3	3	4	7	23.3
Negative with pain	14	4	28.6	1	2	3	21.4
Positive + negative with pain	44	23	52.3	4	6	10	22.7
Negative, no pain	23	6	26.1	1†	1†	1	4.3

* The complications included are coronary occlusion, pulmonary edema and congestive failure

† Same patient

the cardiac lesions were often progressive. Some of these patients later showed a positive reaction, and a relatively large number during the follow-up period either had serious complications or died (table 3). In 63.3 per cent of a group of 30 patients showing a positive reaction on the first examination the result remained positive during the follow-up period; 23.3 per cent later either had coronary occlusion, pulmonary edema or congestive failure or died of cardiac disease.

Of a group of 14 patients showing a negative reaction with pain 28.6 per cent later had a positive reaction and 21.4 per cent had complications or died of heart disease. When these two groups are combined, making a total of 44 patients with either a positive reaction or a negative reaction with pain, 52.3 per cent showed a positive reaction during the follow-up period and 22.7 per cent had complications or died.

In contrast to the foregoing figures are the results obtained on 23 patients who had a negative reaction without pain. Of these 26.1 per cent showed a positive reaction on follow-up study but only 1, or 4.3 per cent, suffered from coronary occlusion and later died.

The importance of a negative reaction with pain is brought out in another way when the type of cardiac death is related to the result of the test (table 4). Of the entire series of 137 patients, 15 died of heart disease. Death was acute in 11; of these, 54 per cent showed a positive reaction and 36 per cent a negative reaction with pain. If these two groups are combined, it appears that in 10 of the 11 patients (90.1 per cent) in whom acute cardiac death occurred the reaction either was positive or was negative with pain. In contrast to these observations are the results in 4 patients

TABLE 4.—Type of Cardiac Death in Relation to Result of Test in Fifteen Cases

Death		Result of Test					
		Positive		Negative with Pain		Positive + Negative with Pain	
Type	Number	Number	Percentage	Number	Percentage	Number	Percentage
Acute cardiac.....	11	6	54	4	36	10	90.1
Congestive failure.....	4	0	0	0	0	0	0

who died of congestive failure. None of them showed a positive reaction or a negative reaction with pain. Thus a positive reaction or a negative one with pain indicates that there is a 90 per cent chance, in case of death, that the end will come suddenly or within a short time after an attack of cardiac infarction. If the reaction is negative, death, when it occurs, is apt to be associated with congestive heart failure.

The reasons for the occasional dissociation of pain and electrocardiographic changes during anoxemia are not clear. How painful impulses are initiated in the heart is imperfectly understood. When there is an oxygen want, many adaptive mechanisms are brought into play.⁴ Among these are variations in the cardiac output, the size of the heart, the heart rate, the arterial and venous pressures, the depth of pulmonary ventilation and the caliber of the coronary vessels. The manner in which these factors react on one another at different levels of anoxia and under varying clinical conditions undoubtedly plays a part in determining the effectiveness of the coronary blood flow. With the number of variables concerned it is not surprising that the result should be inconstant.

COMMENT

The use of the anoxemia test in differential diagnosis has already been indicated.¹ The following case is illustrative.⁵

CASE 1.—H. P., a man aged 61, a salesman, was admitted to the hospital on Dec. 29, 1939, with cough, dyspnea on exertion and "heaviness in the left side of the chest" of three weeks' duration. He had previously been in excellent health.

4. Wiggers, C. J.: Cardiac Adaptations in Acute Progressive Anoxia. *Ann. Int. Med.* 14: 1237 (Jan.) 1941.

5. This case was studied by permission of Dr. Robert F. Loeb.

He consulted his local physician, who found nothing abnormal on physical examination. A roentgenogram of the chest was said to show a metastatic growth in the mediastinum. He was referred to the hospital for complete study.

Examination revealed no cardiac enlargement. A souffle was heard above the left clavicle. The heart sounds were normal. The blood pressure in the right arm ranged from 150 to 170 systolic and from 85 to 100 diastolic; in the left arm it was 120 to 130 systolic and 90 diastolic. The first impression was that the patient had either carcinoma of the bronchus or an aneurysm of the aorta, probably the former.

The electrocardiogram showed low T waves and slight depression of the RS-T segments in the three standard leads. Roentgenograms of the chest showed a little dilatation of the ascending and the descending portions of the aorta. There were numerous dense streaky shadows radiating from the upper portion of the hilus of the right lung into the upper lobe on the right side. The appearance of these shadows suggested peribronchial fibrosis and scarring as the result of a tuber-

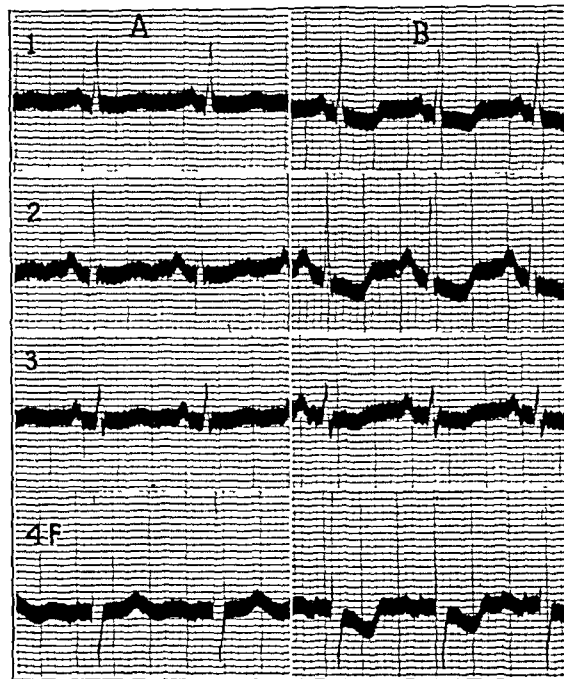


Fig. 1.—Result of the anoxemia test on H. P. (case 1). There had been cough, dyspnea and "heaviness in the chest" on effort for three weeks. Carcinoma of the lung or aortic aneurysm was at first suspected. The anoxemia test established the diagnosis of coronary sclerosis. a, control; b, after the patient had breathed 10 per cent oxygen for twenty minutes. There was no pain.

culous lesion. There were no changes suggesting a neoplasm. The heart was not enlarged.

The anoxemia test gave a positive result (fig. 1). There was a total RS-T deviation of 4 mm., and the T waves became inverted in leads 1 and 4 F. A diagnosis of coronary sclerosis was made.

In June 1940 the patient reported that he was having only occasional precordial oppression, relieved by the use of glyceryl trinitrate. An electrocardiogram was similar to the one previously made, and a roentgenogram of the chest likewise showed no change. The last follow-up examination was in November 1940. He was drinking rather heavily but did not complain of cardiac discomfort. An electrocardiogram taken at this time showed the T waves in leads 1 and 2 to be of even lower amplitude than before. In April 1941 word was received that he was in an institution because of chronic alcoholism.

Recently confirmation of the value of the test in diagnosis appeared in the paper of Evans and Bourne.⁶

6. Evans, Courtenay, and Bourne, Geoffrey: Electrocardiographic Changes After Anoxemia and Exercise in Angina of Effort, *Brit. Heart J.* 3: 69 (Jan.) 1941.

They administered a 10 per cent oxygen mixture for three to five minutes and found that of 20 patients with angina of effort in whom the four lead control electrocardiogram showed no significant change 6 gave abnormal ST and T wave responses. The period of anoxemia employed by these investigators was relatively short. It is not surprising, therefore, that in

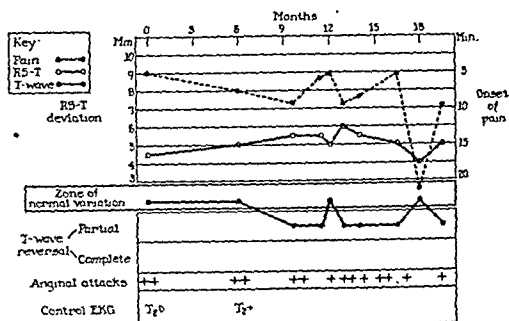


Fig. 2.—Correlation of anoxemia tests of J. F. (case 2) with clinical course. He had attacks of cardiac pain for nine years, during which the diagnosis at various times was neuritis of the ulnar nerve, hyperthyroidism and cardiac neurosis. There was slight clinical improvement during the period of observation; the coronary reserve was variable but always reduced. In this and subsequent graphs the "zone of normal variation" covers the range of change caused by anoxemia in the electrocardiograms of normal persons. "Pain" refers to discomfort experienced during the test, and the time of its onset is charted. The "RS-T deviation" represents the sum of this measurement in all four leads. "T wave reversal" refers to this change in lead I, lead 4F or both.

their experience an exercise test produced an abnormal response a little more often than did the anoxemia test; but occasionally they noted changes in the electrocardiogram after anoxemia when no such changes followed exercise.

Through additional experience we have found no reason to change our criteria for a positive reaction. However, some significance, it appears, must now be attached also to a test which gives electrocardiographically negative results but during which pain appears. This is particularly true if the pain occurs during the first ten minutes of induced anoxemia. Four patients with negative reactions and such an early appearance of pain died within three years.

In reporting the results we have already directed attention to the relatively high incidence of complications and deaths among patients with coronary sclerosis who have shown a positive reaction or a negative reaction with pain, in contrast to the low incidence among patients with a negative reaction without pain. Similar evidence indicating the importance of a negative reaction with pain has been presented in the analysis of acute cardiac deaths as compared with deaths due to congestive failure. For the present, therefore, we are inclined to regard a negative reaction with pain as presumptive evidence of coronary insufficiency. The patients in whom this type of response is observed should be followed for further signs of coronary artery disease, and their management should be conservative.

The variable clinical course of persons suffering from coronary sclerosis is common knowledge. Anginal pain in particular tends to vary in severity and frequency. Changes in the form of the electrocardiogram may be observed at times without corresponding variation in symptoms. That either progressive damage or repair can take place in the heart insidiously, because of ana-

tomic changes, has been demonstrated clearly by Blumgart and his co-workers,⁸ who studied the coronary bed in diseased human hearts injected post mortem. They concluded that coronary occlusion if gradual and accompanied by the development of anastomotic circulation does not necessarily produce characteristic clinical manifestations. Variations in the coronary reserve can, however, be demonstrated in patients with this type of occlusion by changes in the response to induced anoxemia. The following cases serve to illustrate this point.

CASE 2.—J. F., a man aged 44, a taxi driver, in 1931 (nine years before his first visit to the hospital) began to notice pain in the left arm on walking. He was seen in the neurologic clinic and was given physical therapy for what was believed to be neuritis of the left ulnar nerve.

In 1935 he was first seen in the medical clinic because the pain in the left arm was worse and after exertion radiated to the left side of the chest. An electrocardiogram showed slight prolongation of auriculoventricular conduction. The PR interval measured 0.21 second. The Kline reaction of the blood was negative. The blood cell count was normal. Thyrotoxicosis was suspected, and partial thyroidectomy was recommended, although the basal metabolic rate was only +8 per cent. The operation, however, was not done.

By 1938 the pain had increased in severity and frequency. It occurred when the patient walked for three blocks. He described one episode of more severe discomfort which occurred while he was at rest. An electrocardiogram made on Nov. 30, 1938 showed inversion of the T wave in leads 2 and 3, together with a large Q_s. Posterior infarction was suspected, although the patient's physician regarded a cardiac neurosis as the most likely diagnosis and recommended reassurance. An anoxemia test done three weeks after the episode of more severe pain gave positive results (fig. 2). The patient experienced discomfort similar to his spontaneous attacks at the end of four minutes. The total RS-T deviation was 4.5 mm. There were no changes in the T wave. The diagnosis of coronary sclerosis was now established.

During the next twenty months he was seen at frequent intervals and numerous anoxemia tests were done. These all gave a positive result. He was last seen in April 1940. He was still having precordial pain radiating to the epigastrium.

He was able to drive his taxi and rarely required glyceryl trinitrate for relief.

That the healing of a cardiac infarct and the development of collateral circulation can be demonstrated by serial tests has been previously pointed out.¹ The following case indicates clearly that improvement in the state of the coronary circulation may take place during the second year following coronary occlusion.

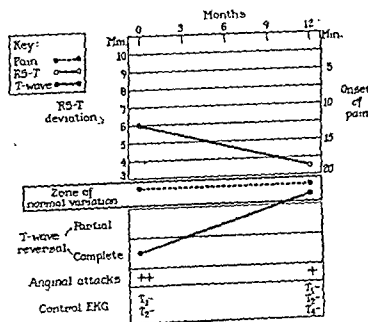


Fig. 3.—Correlation for M. D. (case 3). Cardiac infarction occurred thirteen months before the first test. The clinical condition improved during the period of observation. The result of the anoxemia test, at first positive, became almost negative twenty-five months after the attack. Changes in the control electrocardiogram, however, increased.

CASE 3.—M. D., a man aged 60, a gardener, was admitted to the hospital on Feb. 7, 1939 with severe precordial pain of two days' duration. He had had occasional substernal pressure on exertion for six months. The more recent, severe pain persisted up to the time of his admission to the ward.

7. Levy, R. L.; Bruenn, H. G., and Williams, N. E.: The Modifying Action of Certain Drugs (Aminophyllin, Nitrites, Digitalis) on the Effects of Induced Anoxemia in Patients with Coronary Insufficiency. *Am. Heart J.* 19: 639 (June) 1940. Gold, Harry; Kvit, N. T., and Cattell, McK.: Studies on Purified Digitalis Glucosides: I. Potency and Dosage of "Digitaline Native" by Oral Administration in Man. *J. Pharmacol. & Exper. Therap.* 69: 177 (July) 1940.

8. Blumgart, H. L.; Schlesinger, M. J., and Davis, David: Studies on the Relation of the Clinical Manifestations of Angina Pectoris, Coronary Thrombosis and Myocardial Infarction to the Pathologic Findings. *Am. Heart J.* 19: 1 (Jan.) 1940.

Examination revealed a moderately enlarged heart, distant heart sounds and a systolic blow at the apex. The erythrocyte sedimentation rate was 40 mm. in one hour. The Kline reaction of the blood was negative. An electrocardiogram showed inversion of the T wave in leads 1 and 2 and depression of the RS-T segments in these leads. A roentgenogram of the heart showed left ventricular enlargement and prominence of the aortic knob. The diagnosis was coronary occlusion with

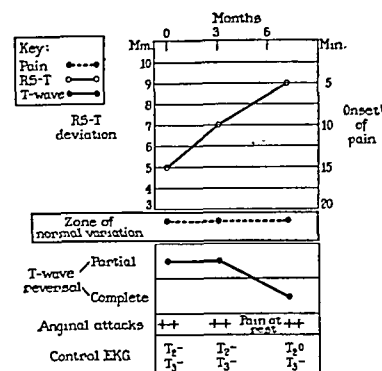


Fig. 4.—Correlation for H. L. (case 4). Cardiac infarction occurred twelve months prior to the first test. The clinical condition was unchanged during the period of observation; the coronary reserve diminished progressively. Death (suicide) occurred one month after the last test.

there was no pain but a total RS-T deviation of 6 mm. and inversion of the T wave in leads 1 and 4 F (fig. 3) were noted.

During the second year after the occurrence of infarction the precordial discomfort decreased. The patient had scarcely any pain except after severe effort, such as carrying a bucket up a flight of stairs. He rarely required glyceryl trinitrate for relief. He had been shoveling coal. The blood pressure was 155 systolic and 78 diastolic. An electrocardiogram now showed inversion of the T wave in lead 4 F. An anoxemia test done twenty-five months after infarction gave a positive result, but the electrocardiographic changes were minimal. There was no pain. The total RS-T deviation was 3.5 mm., and there was no reversal in the direction of the T wave. The size of the heart was unchanged.

The results of the test cannot be regarded as a quantitative expression of the degree of coronary insufficiency. On the other hand, in a given patient a trend, when present, paralleled the clinical course. In other words, if the reaction improved the patient reported that his discomfort, particularly pain, was less frequent and less intense; if the reaction showed greater deviations from normal the clinical condition was aggravated. This is illustrated in the following 2 cases, with their accompanying graphs.

CASE 4.—H. L., a man aged 40, an elevator starter, was admitted to the hospital Feb. 9, 1939 with precordial pain radiating to the left arm. He had had coronary occlusion in April 1938 (eleven months previously). He had been a heavy smoker. The heart was not enlarged. The first sound was diminished in intensity. The blood pressure was 128 systolic and 80 diastolic. The electrocardiogram showed inversion of the T wave in leads 2 and 3 and a large Q wave in lead 3. A teleroentgenogram of the heart showed no enlargement.

He was followed in the outpatient department during the next seven months. According to his reports there was little change in his symptoms. During this period three anoxemia tests were done, all of which gave positive results (figs. 4 and 5). The changes observed became progressively more marked. He committed suicide about one year after his first visit to the clinic. A postmortem examination was not done.

CASE 5.—C. A., a man aged 51, a railroad conductor, was first seen in November 1939, when he stated that he had had attacks of precordial pain for one year. Discomfort radiated

to both shoulders and arms. It was related to exertion and was relieved by the taking of glyceryl trinitrate. He was having three to five attacks a day. On examination there was no cardiac enlargement and the heart sounds were normal. The blood pressure was 150 systolic and 90 diastolic and during subsequent observations was never above 135 systolic and 80 diastolic.

During the following two years he was seen at infrequent intervals and the attacks of pain decreased in severity and frequency. In April 1941, he reported that they occurred only on the most severe exertion. The anoxemia test, which was repeated four times during a year, gave negative results at the end of nine months (fig. 6).

Four patients in the present series who died came to necropsy. The observations on 2 of these have already been reported.³

The third was a white man aged 63 who complained of epigastric pain. Roentgenologic examination of the stomach revealed a duodenal ulcer. He was included in the group of normal persons. An anoxemia test done twenty-four months before death gave negative results, and he did not experience pain while breathing the low oxygen mixture. He died in another hospital of carcinoma of the stomach. No pathologic change in the heart was noted at necropsy.

The fourth patient was a white man aged 39 who for five months had had epigastric and precordial pain induced by effort or excitement. Physical examination gave negative results. The blood pressure was 112 systolic and 78 diastolic. The electrocardiogram showed prolonged auriculoventricular con-

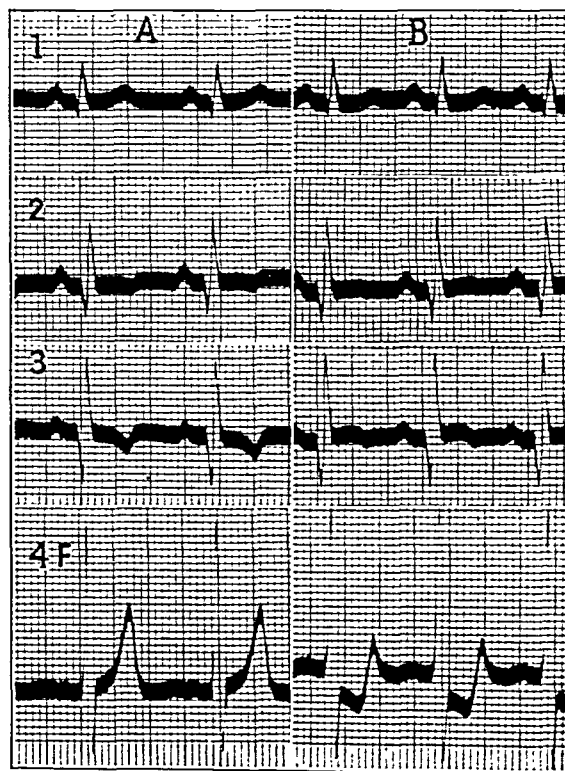


Fig. 5.—Result of the anoxemia test on H. L. (case 4). a, control; b, after the patient had breathed 10 per cent oxygen for twenty minutes. There was no pain.

duction, which at times reached 0.26 second. He was in the hospital for three weeks and was discharged with a diagnosis of chronic rheumatic heart disease. During the following year his symptoms increased and he was again admitted to the ward because of a severe attack of precordial pain which lasted one hour. The heart at this time was enlarged, the sounds were weak and a systolic murmur was heard at the apex. The blood pressure was 100 systolic and 68 diastolic. The tempera-

ture was normal and the leukocyte count was 8,600 per cubic millimeter, with 63 per cent polymorphonuclear cells. He died suddenly eight hours after admission. The final clinical diagnosis was coronary sclerosis and myocardial infarction.

Anoxemia tests were done nineteen, eighteen, fifteen and two months before death. During the first test the patient complained of precordial pain at the end of six minutes; but in none of the tests were significant electrocardiographic changes observed. At necropsy, there were advanced sclerosis of the coronary arteries, with occlusion of the right and circumflex branches of the left coronary artery, and old and recent infarcts of the myocardium, involving the left ventricle and the interventricular septum. There were no lesions of rheumatic fever. The changes in the heart were interpreted as indicating no significant diminution in the coronary reserve, in spite of the extensive disease.

It is not possible on the basis of the result of the test to predict the future occurrence of coronary occlusion. Several patients have suffered such attacks within a few months of the time that a negative reaction was noted. On the other hand, as has already been pointed out, patients with a positive reaction or with a negative reaction with pain are more likely to have this complication than those with a negative reaction. In short, the anoxemia test furnishes information concerning the

coronary reserve only at the time of its performance. It is an index within undefined limits of the functional efficiency of the coronary circulation and yields no information as to the nature or extent of pathologic lesions in the heart.

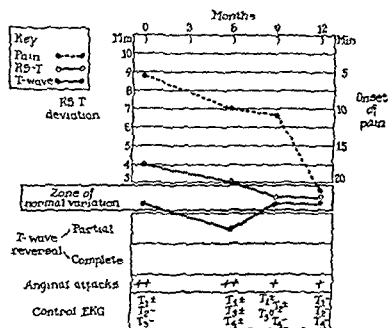


Fig. 6—Correlation for C. A. (case 5). There had been attacks of anginal pain for one month; clinical improvement was noted during the subsequent thirteen months. The result of the anoxemia test became negative, although control electrocardiograms showed increasing changes.

SUMMARY

1. This study is based on 373 anoxemia tests performed on 137 persons

during the past thirty-nine months. On all but 17 patients the test was done at least twice; on some it was done as often as twenty times.

2. A positive reaction was not observed in any patient without cardiac disease or severe anemia.

3. A positive reaction may be regarded as a sign of coronary insufficiency; a negative reaction does not exclude disease of the coronary arteries.

4. The occurrence of pain during a test with a negative result, particularly if it appears during the first ten minutes of induced anoxemia, affords presumptive evidence of a diminished coronary reserve. Under these circumstances the patient should be carefully observed for further signs of coronary disease and managed conservatively.

5. The test is simple and safe. In the past four years it has been done 1,024 times on 442 persons. Unpleasant reactions have been observed forty-six times in 36 patients. But there have been no serious effects, and the course of the disease has not been affected unfavorably as the result of repeated tests.

6. The test is helpful in the differential diagnosis of conditions producing pain in the chest. When the reaction is positive it serves to distinguish discomfort due to coronary insufficiency from that caused by other

disorders. It is useful in following variations in the coronary reserve and so in appraising the efficiency of the coronary circulation at the time of its performance. Serial observations reflect in a general way the trend of the clinical course. The test does not furnish evidence which makes it possible to predict the future occurrence of coronary occlusion. It affords an index within undefined limits of the adequacy of the coronary blood flow, but it yields no information as to the nature or extent of the pathologic lesions in the heart.

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ABSTRACT OF DISCUSSION

DR. ROY W. SCORR, Cleveland: One of the most difficult diagnostic problems which the practitioner is occasionally called on to solve concerns the coronary arteries. In the absence of clear objective evidence of cardiovascular disease are the patient's symptoms those of coronary insufficiency? A person with coronary artery disease may be in imminent danger of death, and yet a most careful and complete examination may reveal no objective evidence of heart disease. Puzzling indeed is the individual primarily interested in establishing a claim for total disability on the basis of coronary insufficiency and angina pectoris. In the light of our present conceptions which regard Heberden's angina pectoris as a manifestation of myocardial ischemia, any safe procedure which loads the coronary circulation and which at the same time gives some objective index of the response would be a valuable test in the study of the occasional difficult case of coronary insufficiency. Such a test appears to be the "anoxemia test" as previously described by Dr. Levy and his associates, and further observations with it we have heard this morning. It seems fair to conclude that at least in Dr. Levy's hands the test has been safe and, when positive, has aided materially in differentiating coronary insufficiency from other disorders which cause chest pain. On the other hand, we must keep in mind that the induction of generalized anoxemia from the inhalation of low percentages of oxygen for fifteen or twenty minutes must be undertaken with great care; that the safety zone is narrow when one is dealing with atmospheres around 10 per cent oxygen, which correspond to an altitude of about 18,000 feet above sea level. Unless one is adequately equipped as is Dr. Levy and thoroughly aware of the dangers of generalized anoxemia particularly to the nervous system, one is not justified, I believe, in using the procedure. A disconcerting note regarding the practical use of the test in the diagnosis of coronary insufficiency was sounded by Dr. C. T. Burnett of Denver in a paper presented before the American Heart Association. He reported unpleasant and at times somewhat alarming reactions, as well as positive electrocardiographic findings in a number of persons with no signs or symptoms of coronary disease. He concluded that the anoxemia test was dangerous and of only limited value in the diagnosis of coronary artery disease. These conclusions from what appear to have been carefully controlled experiments should not go unchallenged.

DR. ARLIE R. BARNES, Rochester, Minn.: As I see the situation, the advisability of recommending this test in clinical practice hinges on three questions. First, is the test safe? Dr. Levy assures us that it is, and in his hands no serious results have followed its use; but he reports that unpleasant reactions were observed 46 times in 36 cases. These reactions frequently consisted of symptoms indicating irritation of the central nervous system. We know that nerve cells are the most sensitive of all tissues to anoxia. This suggests that the possible harmful effects of the test must be assessed as much on symptoms indicating effects on the central nervous system as on those referable to the heart itself. Second, may we accept without question the criteria of abnormal electrocardiographic changes defined by Dr. Levy under the conditions of his experiment? I am certain that Dr. Levy realized these may have to be modified and would welcome a test of their validity by other observers working under the same conditions. Unfortunately, the test cannot be appraised by reference to pathologic findings in the heart, for the test may give negative results, as Dr. Levy

has shown, when the heart is the site of maximal pathologic changes, and positive results when such changes are moderate or minimal. This is another way of saying that functional insufficiency of the coronary circulation can be estimated inadequately from pathologic changes observed in the heart at necropsy. Third, how frequently is the test indicated when a competent internist is unable to arrive at a diagnosis on ordinary clinical grounds? Dr. Levy's published account indicated that even in the presence of clinical evidence of coronary sclerosis the yield of positive electrocardiographic changes varies from 20 to 69 per cent. A negative test does not permit the exclusion of insufficiency of the coronary circulation, as has been pointed out by Dr. Levy and his associates. In the 40 per cent or more cases in which negative results from the anoxemia test are obtained, the clinician is still forced to rely on his clinical judgment in arriving at a diagnosis. For these cases a careful analytic history and tests of the patient's reaction to conditions increasing cardiac work will remain almost the sole basis for the diagnosis of inadequate coronary circulation. This is an important and refreshing approach to this subject. It is to be hoped that competent observers, adhering to the precautions stressed by Dr. Levy, will carry out similar investigations.

DR. C. T. BURNETT, Denver: I think Dr. Scott said he concluded, from my remarks the other day, that I felt the test was of no value. I wouldn't want to go that far. I would say that at present it is not of dependable clinical value. I am not yet convinced that the criteria may not be modified so that, even in this small 5 per cent which Dr. Scott and Dr. Barnes have spoken of, it may be of some value. I became interested in this work about two years ago. My associates and I began a study of 125 persons, in different age groups, as entirely normal as we could determine. If, in the course of the test, these persons had pain, any of these unpleasant manifestations which Dr. Levy mentioned, or anything else which raised any question as to their normality, they were cast out. In addition to these there were 62 cases, which made a total of 189 cases studied. The 62 represented those eliminated from the normal series. In this work we came reluctantly to two complete reversals of opinion, for at the outset we felt the test was dependable. We don't find any significant difference in the response of men from 50 to 60 years to that of men 20 to 30. We duplicated in every respect Dr. Levy's technic. Using this technic and the same apparatus, we found—in the majority of these normal subjects—a usual normal response, identical with that obtained by Dr. Levy and his associates. But in a significant percentage (19.2) of this group we encountered an abnormal response, according to Dr. Levy's criteria. The majority of these showed T_i inverted (Levy's third criterion). There wasn't any great difference in the age groups. We encountered vasovagal reactions, in all instances unpredictable. We encountered two convulsions. One occurred within thirty seconds after the man had responded to a question, when he had seemed to be perfectly conscious. I can't feel that a test which induces such a profound change as to lead that individual into a generalized convulsion is safe. We had no acute pulmonary edema but all the other unpleasant manifestations, I think, that Dr. Levy noted. The question has been raised as to the difference in response between Denver and New York. We used exactly the same percentage of oxygen as did Dr. Levy and—theoretically—we were subjecting our individuals to a little greater strain than in New York. Haden showed that at sea level the blood volume, hemoglobin, red cells and mean corpuscular volume are significantly lower than in Denver, as compared to studies by Mugaage and Andresen. So we feel that with persons who have lived in Denver there is sufficient compensation to make up for this difference.

DR. ROBERT L. LEVY, New York: In our experience, particularly in the hospital, the test has been of practical use in considerably more than 5 per cent of cases in which pain was referred to the chest. It has been helpful, for example, in differentiating discomfort due to gallbladder disease from that due to coronary sclerosis. Dr. Scott has referred to the use of the test as an aid in the determination of disability for insurance purposes. A negative test is without significance; a positive result indicates coronary insufficiency, though it does not measure the degree. In our hands the procedure has been safe,

provided the simple precautions outlined were observed. We are familiar with the effects of anoxemia on the nervous system mentioned by Dr. Barnes. But what happens to guinea pigs in an airplane at an altitude of 18,000 feet is hardly comparable to the effects in human beings, who at sea level breathe 10 per cent oxygen for twenty minutes and whose lungs are then promptly flushed out with 100 per cent oxygen. The fact remains that, in the course of three years, there has been no evidence of injury to the nervous system in our patients. The criteria of a positive test, of course, may have to be modified. We have already modified them once ourselves. The dissociation of pathologic and physiologic findings should be stressed. This test is not an indicator of anatomic changes in the heart. It is intended to afford a rough index of the efficiency of the coronary blood flow within limits which, as yet, are undefined. The studies of Dr. Burnett are not strictly comparable to ours. He has worked at an altitude of 5,000 feet and his subjects, therefore, have experienced atmospheric conditions at 23,000 rather than at 18,000 feet. This difference undoubtedly accounts for some of the discrepancies in the results. The inhabitants of Denver probably are not quite as well acclimatized as he has implied.

CARCINOMA OF THE JEJUNUM AND OF THE ILEUM

J. SHELTON HORSLEY, M.D.

RICHMOND, VA.

Carcinoma of the small bowel is often considered extremely rare. Though it is not common it is more frequent than is usually supposed. Sarcoma, however, is found more often in the lower part of the ileum than in the large bowel. Cancer of the ampulla of Vater and its adjoining tissue increases the incidence of carcinoma of the duodenum.

Three types of carcinoma of the jejunum and of the ileum may be considered: (1) the most common, adenocarcinoma; (2) carcinoid, or argentaffin tumor, and (3) melanocarcinoma.

The paper by Rankin and Mayo¹ in 1930, a later paper by Rankin and Newell² in 1933 and Raiford's³ articles on tumors of the small intestine in 1931 and 1932 were thorough and interesting. They included reports on tumors of the small bowel occurring almost to the time of publication of the reports. Few cases have been added to the literature within the period which these papers cover. At the Mayo Clinic between Jan. 1, 1919 and Oct. 1, 1929 Rankin and Mayo¹ found 31 cases of carcinoma of the small bowel as compared with 2,775 cases of cancer of the large bowel and the rectum and 2,646 cases of cancer of the stomach. Hoffman and Pack⁴ reported that of 228 cases of cancer of the small intestine the cancer was in the duodenum in 45.6 per cent.

In a study of the literature from the time of Raiford's article in 1932 to Jan. 1, 1941 I have found 384 cases of carcinoma and carcinoid of the jejunum and of the ileum. Of these cases, in 236 the tumor was adenocarcinoma of the jejunum or of the ileum, in 7 adenocarcinoma of Meckel's diverticulum, in 138 carcinoid

From the Surgical Department of St. Elizabeth's Hospital.
Read before the Section on Pathology and Physiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Rankin, F. W., and Mayo, C. W.: Carcinoma of the Small Bowel, Surg., Gynec. & Obst. 50:939 (June) 1930.

2. Rankin, F. W., and Newell, C. E.: Benign Tumors of the Small Intestine: Report of Twenty-Four Cases, Surg., Gynec. & Obst. 57:503 (Oct.) 1933.

3. Raiford, T. S.: Tumors of the Small Intestine: Their Diagnosis, with Special Reference to X-Ray Appearance, Radiology 16:253 (Feb.) 1931; Tumors of the Small Intestine, Arch. Surg. 25:122 (July) 321 (Aug.) 1932.

4. Hoffman, W. J., and Pack, G. T.: Cancer of the Duodenum: Clinical and Roentgenographic Studies, Arch. Surg. 35:11 (July) 1937.

of the jejunum or of the ileum and in 3 carcinoid of Meckel's diverticulum. There have been 2 cases of what appears to be primary chorioepithelioma of the small intestine.

MELANOCARCINOMA

Primary melanocarcinoma in the jejunum or the ileum is rare, though a few cases have been reported.



Fig 1—External view of specimen from case 1. The proximal end is greatly dilated. The obstruction from the tumor is almost complete. There was severe kinking.

There have also been instances of what appears to be metastatic melanocarcinoma of the jejunum or the ileum from primary lesions of the skin. The surviving malignant cells seem to filter through the lungs and grow in the favorable tissue of the submucosa of the ileum.⁵

CARCINOID

Carcinoids, or argentaffin tumors, are interesting and unusual. They spring from argentaffin cells, which are distributed throughout the intestinal tract in man and many of the higher vertebrates. These tumors and cells are more common in the appendix, the cecum and the terminal part of the ileum. Most carcinoids are benign, but some are malignant and metastasize into the mesentery, the liver and even the brain.

A carcinoid of the intestine rarely surrounds the whole lumen and does not ulcerate. Consequently there is no blood in the feces and there are no toxic symptoms. Even the malignant type grows slowly, and resection of the bowel for an extensive carcinoid is justified even if there are metastases in the liver.

Carcinoid is apparently much more common than is usually believed. Keasbey⁵ has often observed it during necropsy in elderly patients, particularly men, who have died from other causes.

Grossly an argentaffin tumor on section presents a rather distinctive yellowish color. Histologically the cells of benign and of malignant carcinoids are practically identical.

ADENOCARCINOMA

Adenocarcinoma of the small bowel may be ulcerative, stenosing or polypoid (fungous). Usually the stenosing type is also ulcerative to some extent. Histologically the tumors are classed as simple adenocarcinoma, medullary carcinoma, scirrhus carcinoma and colloid carcinoma. Adenocarcinoma is by far the most common type. The medullary and scirrhus types are rare. Adenocarcinoma has a tendency toward retaining the original acinous formation. The cells arising from the mucous membrane infiltrate the wall of the bowel and break down into ulceration. Occasionally the differentiation of cells and the formation of acini is so nearly complete that the histologic diagnosis of carcinoma is made chiefly by the infiltration of the growth and by the number of mitotic figures and the appearance of the individual cells. They may, however, become more active and invade in sheets. Metastasis to the lymph nodes occurs early. Colloid carcinoma of the small intestine is similar to colloid carcinoma of the stomach or the colon.

The fungous, or polypoid, type may arise from an adenoma. It usually protrudes into the bowel and often produces obstruction either from direct mechanical



Fig 2—Section of the tumor in case 1, a colloid adenocarcinoma. There is a considerable amount of colloid material along with some adenomatous tissues. Slightly reduced from a photomicrograph with a magnification of 200 diameters.

occlusion or from intussusception. Intussusception occurs with the stenosing or napkin ring type, but it is infrequent compared with intussusception from polypoid or fungous carcinoma.

The early symptoms of carcinoma of the small intestine do not differ materially from the symptoms of

⁵ Horsley, J. S., and Keasbey, Louisa E.: Tumors of the Small Intestine, in Lewis, Dean Practice of Surgery, Hagerstown, Md., W. F. Prior Company, Inc., 1939, vol. 6, chap. 17.

incomplete obstruction. Martin⁶ has called attention to chronic incomplete obstruction of the small intestine. The symptoms often are vague and indefinite. The modern technic of roentgenologic study of the small bowel aids greatly in the diagnosis, but it must be followed through carefully over a period often of twelve or more hours. The main point is to deter-

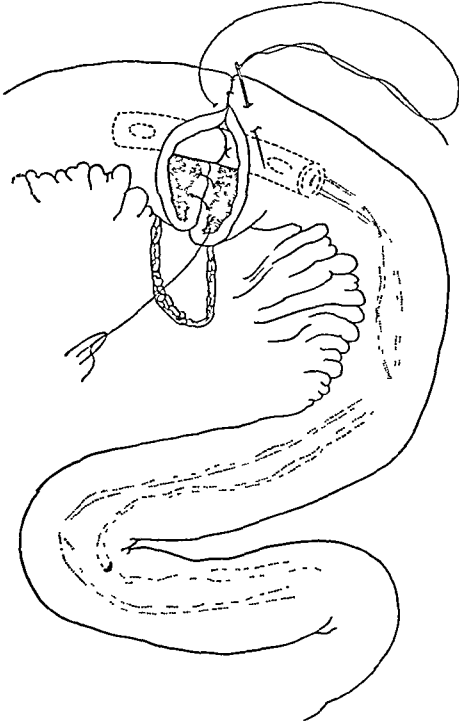


Fig. 3.—Technic of end to end intestinal anastomosis. The rubber tube with additional perforations has been fastened to the posterior margin of the union with a single suture of silk. In order to facilitate its expulsion, long threads of silk or cotton may be fastened in the distal end. The presence of the tube provides against immediate obstruction from swelling and renders safer the insertion of additional suturing to turn in more of the bowel.

mine delayed emptying. Many conditions, such as avitaminosis, sprue, pellagra and hypoproteinemia, may cause this delay, but partial mechanical obstruction should always be considered.

The clinical symptoms in the earlier stages may be gaseous distention, heart burn, reflex pylorospasm and periods of diarrhea often alternating with periods of constipation. A lesion in the ileum when not completely obstructive frequently causes irritation, with consequent diarrhea. According to Martin,⁶ patients with partial obstruction may complain of a certain awareness of their intestinal motility and fatigue which occurs before meals and suggests the possibility of hypoglycemia. Such patients are frequently classed as neurotic. They often speak of discomfort rather than pain, and this discomfort may be accentuated by the ingestion of meals. Martin stated that sometimes it appears before the evening meal or may awaken the patient at night. Dizziness, he said, is another symptom experienced by many patients. The dizziness may be intense and may not be due to any apparent cause. Unexplained and unpredictable mild waves of nausea occur. The duration of symptoms varies from a few months to many years. Incomplete obstruction seems to occur with about equal frequency in the two sexes.

6 Martin, Ly: A Discussion of Some Conditions Producing Chronic Low-Grade Obstruction of the Small Intestine, *Mississippi Doctor* 18: 308 (Nov.) 1940.

When obstruction becomes complete it assumes the usual features of complete obstruction from any mechanical cause. It may occur from a particle of food lodging in the constricting napkin ring type of cancer. Occasionally the particle is dislodged, and the patient is temporarily relieved. The use of the Miller-Abbott tube combined with roentgen examination is often helpful in making a diagnosis.

Adenocarcinoma of the jejunum or of the ileum is more common in the upper part of the jejunum, near the ligament of Treitz. When the tumor is situated there, vomiting, particularly of large quantities of material, is a prominent symptom, even when the obstruction is not complete. If the tumor is in the lower part of the jejunum or in the ileum occasionally a movable mass may be felt, and when the mass slips from beneath the examining fingers readily it is suggestive of a tumor of the small intestine (Rankin). Occasionally there may be tarry stools, but occult blood is present in almost all cases of adenocarcinoma.

With ulcerating carcinoma of the jejunum or the ileum there is usually anemia, partly from the loss of blood and partly from the toxic products of the ulceration. With intussusception the pain is sharp and agonizing, and shock often develops soon. If the patient is thin there is visible peristalsis or counterperistalsis after any obstruction. If the tumor is high in the jejunum distention may be absent, but if it is low in the jejunum or in the ileum abdominal distention is severe.

The prognosis for malignant diseases of the small intestine is poor, probably largely on account of the difficulty of diagnosis and the lack of obvious symptoms until the condition is well advanced.

REPORT OF CASES

CASE 1.—H. K. W., a white man aged 59, admitted to the hospital April 11, 1939, had been in fairly good health until six months before admission, when he had mild indigestion,



Fig. 4.—Internal view of the tumor in case 2. The napkin ring portion is completely infiltrated with cancerous tissue except for a small area of mucosa. The proximal end is enormously dilated.

feeling as though his food would not leave his stomach properly. This gradually grew worse, and in the last three weeks nausea and vomiting had been severe. The indigestion usually appeared in the early afternoon about an hour after lunch but occasionally occurred even when the patient did not eat. Fullness and a desire to eructate were common. There had been no actual pain at any time. The patient felt better if he was quiet.

There was no blood or "coffee grounds" in the vomitus; it would often contain old undigested food. The stools were normal and were usually light in color.

There was borborygmus, with an indefinite sense of resistance in the upper part of the abdomen but no distention. The patient was sallow and the skin loose. Roentgenologic examination made a few days before admission to the hospital revealed obstruction in the upper part of the jejunum. There was no free hydrochloric acid in the gastric contents after twenty-five or after forty-five minutes; the combined acidity was 20 after twenty-five minutes and 16 after forty-five minutes. The gastric contents were bright yellow. The blood showed 4,687,000 red cells and 85 per cent hemoglobin, and the white cell count was 8,120, with 81 per cent polymorphonuclear cells. The Wassermann reaction was negative. The diagnosis was cancer of the upper portion of the jejunum.

Operation on April 12, with the patient under anesthesia with ethylene and local anesthesia, disclosed a firm growth in the



Fig. 5.—Section of adenocarcinoma of the jejunum (case 2). The acini are fairly well formed, and the tumor seems to be about grade 2½. Sections from tissue in the ovary and in the lymph nodes presented the same general structure (× 250).

upper portion of the jejunum just below the ligament of Treitz. There was no evidence of metastasis. Though the growth was adherent, it was fairly movable but could not be delivered into the wound. The tissues around it were vascular. After resection the upper stump was short. The lower stump was rotated slightly so that the left surface was posterior, and an end to end union was made. Before the suturing was completed a soft rubber tube 5 cm. in length was placed in the lumen and fastened to the posterior margin of the united bowel with a silk suture. A tube gastrostomy was made by inserting a catheter in the stomach near the greater curvature and bringing it out through a stab wound in the abdominal wall.

The specimen consisted of a segment of jejunum 15 cm. in length. The space distally from the tumor to the end of the specimen was 8.5 cm. The growth itself was 3.5 cm. in length. There was some infiltration into the mesentery. Obstruction was caused partly by angulation and kinking, though the center of the tumor showed on section almost complete occlusion of the lumen. The mucosa was edematous and pale yellow. There was no distinctly ulcerated area, though

the mucosa was eroded at one point opposite the mesentery. Microscopic examination revealed colloid carcinoma with intervals of adenocarcinomatous structure (figs. 1 and 2).

On December 22 the patient fell and fractured the right tibia and fibula just above the ankle. There was at that time no evidence of a recurrence or metastasis of the cancer. On March 5, 1941 he reported that his general condition "seemed to be excellent."

CASE 2.—Mrs. W. S. B., a white woman aged 57, had a cholecystectomy elsewhere on Aug. 4, 1940. Her symptoms were not relieved. There were intermittent episodes of vomiting which gradually became worse. She occasionally vomited food which had been taken into the stomach two days previously. Between the attacks food apparently passed through normally. Her mental condition was disturbed, and on the day of admission she had two convulsions in which the left side was chiefly affected. Roentgenologic examination made elsewhere before admission did not disclose any lesion in the gastrointestinal tract.

She entered the hospital on November 17 partly unconscious and vomiting at intervals large quantities of fluid in which there was bile. The abdomen was severely distended. Introduction of a Miller-Abbott tube relieved the distention but did not appear to alter the other symptoms.

A careful roentgen examination with the Miller-Abbott tube in position disclosed an obstruction apparently in the middle of the jejunum.

After a transfusion of blood and the intravenous administration of dextrose in Ringer's solution, she was operated on during spinal anesthesia on November 27. In the jejunum was an extensive constricting lesion that appeared malignant. It was removed along with a considerable amount of attached mesentery in order that the involved lymph nodes might be obtained. An end to end union was made, and a medium-sized soft rubber tube about 5 cm. long was sutured to the margin of the anastomosis before the final sutures were placed (fig. 3). There was also a superficial lesion in the cecum, apparently a contact metastasis. The terminal part of the ileum, the cecum and the ascending colon were resected, and an end to side union was made. A tumor of the right ovary and what seemed to be an inflamed appendix epiploica from the sigmoid flexure were also removed.

The specimens consisted of two segments of the intestine (one from the jejunum and another from the terminal part of the ileum, the cecum and the ascending colon) the right fallopian tube and ovary and an appendix epiploica from the sigmoid flexure. The segment of the jejunum was 98 cm. long. The distance from its upper end to the tumor was 43 cm. The proximal portion was greatly dilated. In the mesentery were some small lymph nodes. On section one could see that the tumor almost completely surrounded the lumen of the bowel, though there was one area of mucosa 0.5 cm. wide that was not involved. The growth had a napkin ring appearance and an irregular contour. There was a small ulcerated area; most of the tumor was firm (fig. 4). Microscopic sections showed adenocarcinoma with acini fairly well formed, about grade 2½ (fig. 5). In the segment of the ileum, cecum and ascending colon the lumen was not affected, but the superficial tissues over the ileocecal valve and over the ascending colon showed two lesions, one 1.75 cm. and the other 2 cm. in diameter. Microscopic sections from both showed the same type of adenocarcinoma as that in the jejunum. These lesions doubtless were contact implants. The growth from the ovary measured 4 by 2.5 by 2 cm. There was a constriction near its center. It was of the same structure as the jejunal growth, evidently an implantation metastasis.

The patient's general condition was fairly good after the operation, but her mental symptoms grew worse. It was thought that the mental condition might be caused by avitaminosis and malnutrition, though there was a possibility of metastasis to the brain. Evidences of increased brain pressure appeared, and after consultation with a neurologist it was thought that decompression was indicated. Two days after the abdominal

operation subtemporal decompression was done on the left side, with local anesthesia. After removal of the bone the dura did not pulsate. It was opened, and a small amount of clear fluid escaped. The cortex of the brain was edematous. While the wound was being closed the patient's respirations suddenly ceased and could not be restored.

Necropsy revealed that both anastomoses were in good condition. The upper one was 44 cm. below the ligament of Treitz. There was no evidence of metastasis except one lymph node at the base of the mesentery near the site of the resection of the jejunum and a superficial nodule in the sigmoid flexure. After the brain had been hardened it was examined by Dr. John S. Howe at the Medical College of Virginia, who reported as follows:

"The sections show multiple focal areas of hemorrhage and necrosis chiefly in the white matter of the cerebral cortex, with more or less well defined degenerative changes of the ganglion cells and rather diffuse endothelial proliferation of small vessels, blood in the subarachnoid spaces and one area of coagulation necrosis in the gray matter of the cerebral cortex. No evidence of any metastasis of the tumor is seen. Diagnosis: hemorrhagic encephalitis of undetermined cause. The lesions are somewhat suggestive of those seen in Wernicke's encephalopathy, which have been fairly well shown to be due to deficiency of vitamin B₁. However, the distribution of the lesions is different in this case and if they are due to some vitamin deficiency they are certainly atypical."

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ABSTRACT OF DISCUSSION

DR. FRED W. RANKIN, Lexington, Ky.: Horsley has brought up to date a subject which is rare in occurrence but of more than academic interest. Tumors of the small bowel are rare whether they are benign or malignant. They are difficult of diagnosis and, more important, the malignant ones are uniformly of unfavorable prognosis. My experience with carcinoma of the small bowel was published in a paper in 1930 which reviewed 31 cases. Subsequently in 1933, with Newell, I reported 24 cases of benign tumors of the small bowel. The rarity of occurrence of either type of tumor is emphasized in all reports both in the foreign literature and in that of the United States and, it is interesting to note, the actual percentage varies in the writing of different authors. The symptomatology of carcinoma of the small bowel as a whole presents no characteristic pattern because of the usual failure of stenosis to develop early in the disease. The primary signs and symptomatology are directly related to intermittent obstruction and secondary anemia. The lack of obstruction and variability of the symptomatology depends on (1) the extent of the local growth, (2) extent and situation of metastasis, (3) individual resistance and (4) the grade of the carcinoma. Usually the symptoms are chiefly of intestinal origin. Their duration may vary from a few months to several years, the average being about one year and three months. In our series anemia was the usual picture, although varying with an average hemoglobin estimate of about 59 per cent. In 9 of the cases the reading was below 40 per cent, and the anemia was so progressive as to mimic a picture of pernicious anemia. The determination of the type of anemia whether primary or secondary is relatively easy for a hematologist, but it should be emphasized that this pronounced anemia without visible loss of blood is also a symptom of carcinoma of the right colon and here, as in colonic cancer, repeated tests for occult blood are usually of significance in suggestive cases. Roentgenologic examination is important from a negative standpoint, and only an occasional case will be actually diagnosed by the roentgen ray. Pathologically these tumors are usually adenocarcinoma developing on degenerating polyps, or of the ring type, similar to that found in the lower left colon. Metastasis occurs relatively early, owing to the rich lymphatic supply of the small bowel, and because of the impairment to the digestive function of this portion of the alimentary canal resection of the tumor when

possible is desirable. The deplorable prognosis is one of the most unfortunate features of this disease. The range of life following successful surgical removal in our series was from one month to three years, and the average was less than one year. In our experience aseptic end to end anastomosis was the procedure of choice and lateral anastomosis sidetracking the growth was useful as a sidetracking palliative maneuver.

BLOOD PROCUREMENT FOR THE ARMY AND NAVY

PRELIMINARY REPORT

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In January 1941 the Blood Transfusion Association¹ concluded its project in supplying blood plasma to England. This work, carried on in cooperation with the New York chapter of the American Red Cross and subsequently with the assistance of the Brooklyn chapter, was performed almost exclusively by volunteers in nine hospitals in New York and dealt with 17,000 donors during the period August 1940 to January 1941. This was the first time in the history of the country that the procurement of blood was carried on in such a large scale. It was apparent that not only had considerable material aid been given to Great Britain but the knowledge gained in the operation of this project would be invaluable in case of a national emergency in this country.

In February 1941, to fulfil the request of the surgeon generals of the Army and Navy of the United States for 15,000 units of dried plasma, a pilot bleeding unit was established in New York at the Presbyterian Hospital under the auspices of the New York chapter of the American Red Cross. This unit was under the direction of Dr. Charles R. Drew, who had been the medical supervisor of the Blood for Britain Project. It was felt that, by the establishment of such a unit before the need for larger quantities of blood became pressing, the technic and organization could be standardized on the basis of actual experience. This unit was organized with the following aims in view:

1. Efficient collection of large quantities of blood in as short a time as possible.
2. The development of a technic which would enable this to be carried out in as simple a manner as possible without any danger to the donor or damage to the blood obtained.
3. Flexibility of organization and technic so that whether whole blood, serum or plasma was requested the demand could be met with a minimum of adjustment.
4. Adaptability of the organization for civilian use at the conclusion of the present emergency.

This unit was in full operation in May 1941 under my direction when the request for an additional 200,000 units was made. At that time, the medical departments of the Army and Navy requested the American Red Cross and the Division of Medical Sciences of the National Research Council to organize a cooperative project for the collection of blood from volunteer donors. These donors were to be solicited by the American Red

The blood that has been taken in this project has been processed by Sharp & Dohme Laboratories, Glenolden, Pa., whose cooperation in all phases of the work has been of great value.

1. Report of the Blood Transfusion Association Concerning the Project for Supplying Blood Plasma to England, carried on jointly with the American Red Cross from August 1940 to January 1941. Stetten, DeWitt: Blood Plasma for Great Britain Project, *Bull. New York Acad. Med.* 17: 27, 1941.

Cross through their various chapters in the localities in which it seemed advantageous to establish bleeding units. The technical aspects of the project, such as determination of the type of equipment, technic and personnel were to be supervised, in an advisory way, by the National Research Council.² During the period Feb. 3 to Sept. 18, 1941 this pilot unit has had experience with 10,000 volunteers. This report is concerned with the data that have been accumulated in the conduct of the project.

GENERAL CONSIDERATIONS IN RELATION TO THE DONOR

Every consideration should be given to the volunteer donor. The donor requirements and the technic of bleeding have been set up to afford him a maximum of protection. It is important that all his activities at the bleeding station be under the direct supervision of the physician in charge. All questions as to eligibility of donors and any untoward reactions that occur while the donor is at the station should be brought immediately to the physician's attention. This not only facilitates the operation of the unit but adequately covers the medicolegal aspects.³

It is well established that the withdrawal of 500 cc. of blood has no deleterious effect on the health of properly selected donors. In fact it seems to promote the sense of well-being in some donors and improve their general health.⁴ Serious accidents⁵ have rarely been reported but none have occurred with this unit.

The chief problem confronting the bleeding unit is that of syncope. Not only is it deleterious to the morale of the other donors but it greatly hampers the efficiency of the bleeding unit. A pleasant, interested attitude on the part of the entire staff is of paramount importance. The operation of the bleeding unit should give the appearance of easy and unhurried efficiency. This adds greatly to the impression that the donation of a pint of blood is a simple procedure and not a major ordeal.

Although the donors should be instructed not to eat a fatty meal for at least four hours before coming to donate their blood, it should be emphasized that they should not fast. Some simple nourishment should be taken before coming to the bleeding station. At the conclusion of the venesection facilities should be available for the donor to rest for a short period and to receive some form of nourishment.

Just what part the type of bleeding room plays in the problem of fainting is difficult to evaluate. In general there are two types of arrangement that allow for efficient operation. One has individual cubicles with either fixed or movable partitions, and the other is a common bleeding room with all the bleeding couches in full view. This unit has had experience with both arrangements and has found little to choose between the two plans.

2 The National Research Council assumed responsibility under the terms of the agreement.

3 Martin, E. Claims of Donor—Medicolegal Study, *Med. Klin.* 35: 802-3, 1939. Steinsaltner, B. Medicolegal Aspects of Blood Transfusion, *Ztschr. f. d. ges. Krankenhausw.*, June 7, 1938, p. 233.

4 Cadham, Fred. The Effect on Donors of Repeated Limited Blood Loss, *Canad. M. A. J.* 38: 465, 1938. Martin, J. W., and Myers, J. T. The Effect of Blood Transfusion on Donors, *J. Lab. & Clin. Med.* 20: 593, 1935. Weiner, A. S. Blood Groups and Blood Transfusion, ed. 2, 1939. Charles C. Thomas, 1939. Riddell, V. H. Blood Transfusion, New York and London, Oxford University Press, 1939.

DeBakey, Michael, and Honold, Edith. Blood Transfusion: Part I, *Internat. M. Digest* 33: 301-313, 1938, Part II, *ibid.* 33: 367-380, 1938, Part III, *ibid.* 34: 49, 1939.

5 Levine, Philip, and Katzin, E. M. A Survey of Blood Transfusion in America, *J. A. M. A.* 110: 1243-1248, 1939. Fatality in a Blood Donor.¹²

PROCUREMENT OF THE DONOR

Duran-Jorda,⁶ in reporting his excellent work in the Spanish Civil War, stated that "the success of any transfusion service depended on the organization of the donors." No amount of technical perfection and equipment will be of any value if the supply of donors is not adequate, hence the organization of an efficient recruiting service should be the first step in setting up a bleeding unit. Unless a center can provide at least 50 donors a day, it is not practical to set up a bleeding unit in that locality. Before the unit begins operation, at least 300 donors should be signed up to give blood. The recruitment of donors, particularly in large communities, cannot be done simply by advertising with a few posters and newspaper articles. Experience has shown that personal contacts with fraternal groups, churches, unions, office and department store employees and factory groups is the only way that a large number of people can be reached. This entails much detail work and careful preparation. A single day's bleeding should be planned at from ten to twelve days in advance.

It was quickly ascertained by the pilot unit that if a large number of donors were to be obtained the bleeding unit would have to go to the donor. This not only minimizes the amount of time lost from work by factory or store employees but obviates the necessity of people in the outlying districts coming relatively long distances to a central depot.

The actual organization of the recruiting services will depend largely on the facilities of the local Red Cross chapter. The New York chapter of the American Red Cross, at the instigation of the executive director, General Robert C. Davis, has established a volunteer blood donor service under the direction of Colonel Earle Boothe. This service sends cards to each of the donors showing the amount of blood given, the type⁷ and a report of the serologic test. It is much like the certified donor cards that the various volunteer and professional transfusion bureaus throughout the world have employed.⁸ Not only is this information of value to the donor himself but it also serves in communities and store and factory groups as a foundation on which a local volunteer transfusion service may be established. Such a service is of great value to a community in dealing with its local health problem.

DONOR REQUIREMENTS

The following requirements have been established, after a survey of the standards of the various volunteer services that have been in operation in this country⁹ and in Europe¹⁰ and, in particular, those which have

6 Duran Jorda, F. *Lancet* 1: 773 (April 1) 1939; *Rev. san. de guerra* No. 8 Dec. 1937. Pittaluga, M. G. Some Considerations of Blood Transfusion During the Civil War in Spain, *Mem. Acad. de chir.* 65: 1080-1090, 1939.

7 Typing was formerly done by the bleeding unit but now is performed at the processing plant.

8 Kubanyi, E. Three Years Activity in Blood Donor Centers—Municipal Hospitals in Budapest, *Zentralbl. f. Chir.* 65: 2557-2560, 1938. Schrumpt, A., and Hartman, O. Report from the Norwegian Red Cross Blood Transfusion Service, *Norsk mag. f. lægevidensk.* 3: 2247-2255 (July) 1939. Skold, Erik. Donors and Centers and Transfusion Technic—Various Countries, *Svenska Lak-tidning* 36: 273-304 (Feb.) 1939. *Canada Transfusion Services* "Weiner".

9 D. H. W. 1938. Cross Blood Transfusion Projects, *J. A. M. A.* 111: 1938. Howorth, Paul. Improvement in Blood Transfusion—Collection of Test Serums, Cause and Prevention of Subgroups A₁ and A₂, *Arch. Internat. Chir.* 42: 480-497 (March) 1941.

10 Oliver, P. L. A Plea for a National Blood Transfusion Conference, *Brit. M. J.* 2: 1032, 1936. The Victoria and Australian Red Cross Blood Transfusion Services, editorial, *M. J. Australia* 12: 363-364, 1941. Dyke, S. C. The Organization of a Voluntary Hospital Blood Transfusion Service, *Lancet* 1: 1538, 1937. Leeman, N. Blood Banks in Private University Hospitals, *Med. Welt* 14: 433-444, 1940. Kubanyi, Schrumpt and Hartman. Skold.¹²

been set up by the British,¹¹ French,¹² Spanish,⁶ Australian¹³ and Canadian¹⁴ transfusion services during the present war. Certain of our own modifications have been added as the project has progressed:

1. Age: Donors between 21 and 60 years of age are accepted. Under no circumstances is the age limit of 60 to be exceeded. Written permission is required from the parents or legal guardian before suitable minors of either sex may give blood.
2. Sex: Both male and female donors are accepted.
3. Race: Only white donors are taken.
4. Temperature: A donor is not acceptable if the temperature by mouth (three minutes) exceeds 99.5 F.
5. Hemoglobin: No donor is acceptable unless the hemoglobin level is 80 per cent or above. The hemoglobin is to be determined by one of the generally accepted technics (e. g. Dale, Tallqvist, Sahli).
6. Blood Pressure: No donor is acceptable unless the systolic blood pressure is between 100 and 200 mm. of mercury.
7. Pulse: The pulse is to be recorded. Particular note is made of irregularity as well as decided bradycardia or tachycardia.
8. History: The donor is asked the following questions:

1. When did you last donate blood? (At least eight weeks must elapse between each donation.)
2. Have you had any illness in the last month?
3. Have you ever had malaria? tuberculosis?
4. Did you ever have shortness of breath?
5. Have you had swelling of the feet?
6. Have you had a persistent cough?
7. Have you pain in the chest?
8. Have you coughed up blood recently?
9. Do you have fainting spells?
10. Do you ever have convulsions?

If these requirements are adhered to, protection is given to the donor and the possibility of transmission of disease from donor to the eventual recipient is reduced to the minimum. Syphilis, malaria, influenza, measles, allergy, smallpox and disease caused by the rickettsia organisms, and, in the Orient, parasitic diseases such as filaria, have been reported¹⁵ as transmitted by transfusion of whole blood. The entire question of syphilis will be dealt with under the heading "serology." All persons with recent attacks of malaria or who have had several infections in the past should be turned down. This protects also the donor, since the withdrawal of 500 cc. of blood has been known to cause an exacerbation of the disease. The pooling of the plasma of from 25 to 50 persons should eliminate the danger of transference of any allergy. The history and the evaluation of the general health of the donor should reduce to a minimum the possibility of transference of the other conditions mentioned. Further regulations may be drawn up to control the transmission of any disease that is known to be endemic in a particular locale.

11. The Army Blood Transfusion Service: I, editorial, *Nursing Times*, London 36: 223-224 (March 2) 1940; *Blood for the Army*: I, *ibid.*, pp. 228-229; *Blood for the Army*: *ibid.* 36: 254-255 (March 9) 1940; The Army Blood Transfusion Service: II, pp. 256-258. Edwards, F. R., and Davie, T. B.: Preserved Blood: An Analysis of Its Use—Report from the Merseyside War Blood Bank, *Brit. M. J.* 2: 73-77 (July 20) 1940. Solandt, O. M.: The Work of a London Emergency Blood Supply Depot, *Canad. M. A. J.* 44: 189-191, 1941.

12. Causseret and Jeanneney: Organization of Military Centers for Transfusion of Conserved Blood, *Bull. Acad. de méd., Paris* 121: 722-724, 1939. Maisonnnet and Jeanneney: The Transfusion of Preserved Blood for the Army, *Mém. Acad. de chir.* 64: 1000-1004, 1938. Jeanneney and Castanet: Section of Donors in Respect to the Transfusion of Blood, *Progrès méd.* 1: 861-866, 1938.

13. Wood, I. J.: Transfusion of Stored Blood: Organization of Blood Transfusion Service in Times of National Emergency, *M. J. Australia* 2: 768-774 (Nov. 18) 1939.

14. Canadian Transfusion Services: Personal communication to the author.

15. Douglass, Thomas: A Collective Review of the Literature from 1934 to 1939, *Surg., Gynec. & Obst.* 71: 171-188, 1940. Wiener, Riddell, DeBailey and Honold, Levine and Katzin⁵

THE BLEEDING SET

It was recognized at the outset of this project that the number of satisfactory ways of obtaining blood were myriad. However, when this subject was considered it was felt that whatever bleeding set was used should meet certain general requirements.

1. It must be a completely "closed" system.¹⁶ This means that there should be no manipulations in the assembly of the set from the time it is originally autoclaved until the venesection is completed.

2. There should be no chance for transference of any air into¹⁷ the bleeding bottle which does not pass through a cotton bacterial filter.

3. The parts of the set should be as few as possible. They should be easy to clean and, in order to minimize air leaks, there should be as few joints as possible between the parts.

4. The diameter of the tubing¹⁸ that carries the blood from the vein into the bottle should be appreciably larger than that of the needle in order that the flow of blood will be rapid and uninterrupted.

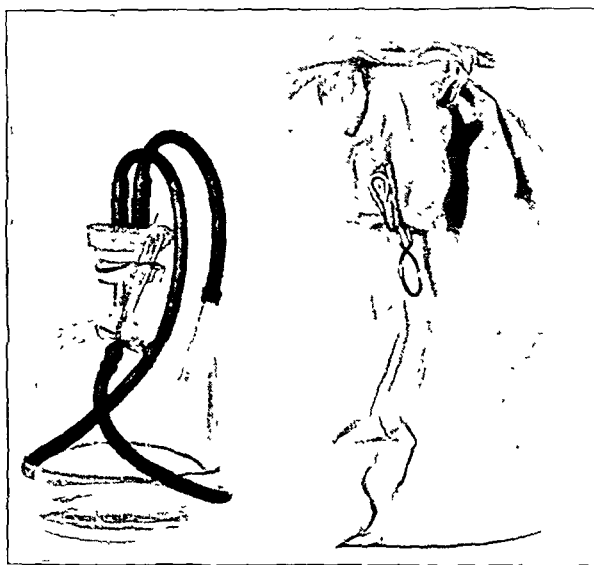


Fig. 1.—The bleeding set used by this unit. The bottle contains 50 cc. of 4 per cent sodium citrate solution. The set is sterilized in the muslin bag.

5. The bottle should have an adequate diameter, approximately 3½ inches, so that there will be no need to agitate the blood to prevent clotting during its collection.

6. The bottle should have a capacity of 550 cc. so that there will be a minimum of air space remaining after the withdrawal of the full 500 cc. of blood.

7. Mouth suction¹ or negative pressure¹⁹ obtained by anything other than a simple hand pump should never be employed.

8. The inlet tubing of the set should be transparent and preferably of latex. Gum rubber tubing tends to stick together after being autoclaved.

9. The needle should be of a fairly large caliber. Gage 15 has been found to be suitable for both male and female donors.

16. Riddell,⁴ Duran-Jorda,⁶ Pittaluga,⁶ Edwards and Davie.¹¹

17. Biddle, E., and Langley, G. F.: Transfusion with Conserved Blood, *Brit. M. J.* 1: 555-556, 1939. Johnson, B. A., and Meleny, F. L.: Bacteriological Control of the Various Stages in the Preparation of Plasma and Serum, *Proc. Am. Serum A.*, 1941.

18. Tuohy, Edward B.: Blood Transfusion and the Storage of Blood for Emergency Procedures, *Surgery* 4: 261-270, 1938.

19. Fatality in a Blood Donor, editorial, *Brit. M. J.* 2: 311 (Aug. 31) 1941.

The exact dimensions and shape of the bottle are of little moment but the bottle should be designed to fit the available centrifuges and be readily obtainable and easy to clean. In order that the inlet tubing fit tightly about the needle, it is preferable that it have a hose hub. The needle that has been employed in this project has a cross bar just distal to the hub, similar to the Lewisohn needle. This type is strongly recommended, as it facilitates handling without contamination and can be left in place in the donor's vein without being held or having some sort of adhesive strapping applied.

Figure 1 shows the bleeding set used by this unit. The bottle contains 50 cc. of 4 per cent sodium citrate.

ORGANIZATION

There are two main functions of a blood donor service—that of recruiting the donors and that of bleeding them. It suffices to say that the recruiting of the donors should be carried out by a full time director. The organization of his staff depends on the individual requirements of the local Red Cross chapter.

The most effective personnel for a bleeding unit is one physician, one secretary, four nurses and one or two

pulse and history are taken by one of the nurses at a second table. The donor is then referred to a dressing room. White gowns similar to the so-called Hoover apron have been provided for the donor by this unit. He is then directed to the bleeding room, where his blood pressure is determined. The physician in charge checks the record card to see that the donor has met the minimum requirements.

The basis of the arrangement of the bleeding room is a unit of two beds and a work table under the supervision of one nurse (fig. 2). As many as six of these units can be efficiently handled by one experienced physician. Whether a single large bleeding room or the cubicle system is adopted the floor plan should be such that the physician can at all times oversee the bleeding of each donor.

VENESECTION

If the donor fulfils the established requirements, a small area about the site of the vein selected for venesection is prepared with soap, alcohol, iodine and alcohol. An intradermal wheal of 1 per cent procaine hydrochloride is administered. The bleeding set is removed from the muslin bag by the nurse. The physician unsheathes the needle from its Wasermann tube covering and introduces it into the vein. Unless something untoward arises, the rest of the phlebotomy is carried out by the nurse. It should be noted that no sterile drapes, masks, gloves or special gowns are used. "Cutting down" on a vein is never employed.²¹ No more than two attempts to obtain blood should be made on a donor.

The procaine hydrochloride is supplied in 2 cc. syringes, a separate needle being used for each donor. These needles are kept in individual cotton-stoppered tubes. The syringes are all filled at the start of the bleeding day by a nurse using operating room technic. Each syringe will supply sufficient procaine hydrochloride for six or eight

wheals and is not refilled unless it has been autoclaved.

The donor assists in maintaining the flow of blood by slowly opening and closing his hand. Suction is rarely employed and then only a small hand pump is used.

At the conclusion of the bleeding, the inlet tube is clamped as close to the bottle as possible and the serologic sample obtained by stripping the distal portion of the tubing. The arm is cleansed and a suitable dressing applied over the site of venepuncture. The bleeding bottle is then properly tagged and the sticker applied to the serologic sample. Both are placed immediately in a constant temperature ice box. After the donor has rested on the bleeding couch for ten minutes he is directed to the refreshment room.

REFRIGERATION AND TRANSPORTATION

The cooling of the blood²² should be begun as soon as possible after it has been taken. When the unit is operating at a fixed station the blood taken should be placed in a constant temperature ice box which maintains a range of from 2 to 4 C. This ice box should

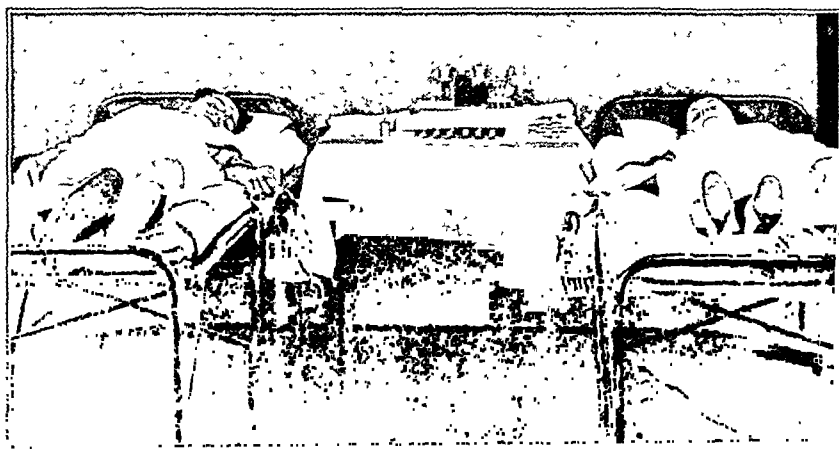


Fig. 2.—This unit of one work table and two beds, under the supervision of one nurse, is the basis on which the bleeding center is set up. It will be noted that men and women use the same bleeding room.

shipping clerks. This staff is similar to that employed by the various depots of the British Transfusion Service.²⁰ Such a unit can easily care for 75 to 80 donors in from four to six hours and has bled 100 male donors in less than four hours. With a personnel of this size, two functions of the work are left to volunteers, namely receptionist work and the dispensing of refreshments. The unit is organized on the basis of employing as few physicians as possible, with emphasis on a highly efficient nursing group. Not only is this a workable plan but in times of national emergency it would permit widespread extension of the work with the addition of a relatively small number of physicians.

If feasible, the space employed should be so arranged that the donor progresses consecutively from registration through to the completion of the bleeding. On arrival at the bleeding station, the donor is directed to the unit's secretary, who registers him on the permanent record card and witnesses the signature of the release. At this time, the tag for the bleeding bottle and the sticker for the serologic sample are filled out. The hemoglobin content is determined and the temperature,

20. The Army Blood Transfusion Service, editorial, *The Bystander*, London, May 22, 1940, pp. 232-233; also the editorials referred to in footnote 11.

21. Riddell,⁴ Oliver.²³
22. Scudder, John: *Studies in Blood Preservation: The Stability of Plasma Proteins*, Ann. Surg. 112: 502-919, 1940. Duran-Jorda,⁵ Hov-worth and Skinner,⁶ Pittaluga.⁶

be of the "blood bank" type with no "cold spots." It should have a temperature recording device and an alarm system to warn of any deviation. Small, portable,²³ insulated boxes that have a bunker for solidified carbon dioxide are suitable for operation with the mobile unit. Ordinarily, solidified carbon dioxide should never

TABLE 1.—Summary of Experience with Procurement of Blood from February to September 1941

Month, 1941	Number of Donors Who Came to Donate	Number of Bleeding Days	Number Rejected	Number Accepted	No Blood Obtained	Blood Obtained	Positive Serology
February.....	830	21	22	828	14	814	2
March.....	1,184	28	33	1,151	14	1,137	4
April.....	1,144	26	45	1,099	6	1,093	2
May.....	1,974	25	35	1,939	8	1,931	6
June.....	1,859	26	40	1,819	14	1,805	0
July.....	1,619	22	53	1,566	19	1,547	4
August.....	851	19	46	805	3	802	2
September 1-17 inc.	519	11	33	486	3	483	4
Totals.....	10,000	178	307	9,693	81	9,612	24

be employed as a blood refrigerant. However, since the box is in use for a relatively short period of time, is frequently opened and the solidified carbon dioxide has no direct contact with the blood, it has been found that it is safe to use such a container for the mobile unit.

If the blood is not allowed to go below zero or above 10 C. during the time that it is in transit to the processing plant, no damage will be done to the blood. A large, portable refrigerator box, known as a Church container, has been successfully employed by the New York unit. This container, which has racks for 80 bleedings, must be precooled with solidified carbon dioxide for from eight to twelve hours before use. A bunker is provided for the ice that is used as the refrigerant in transit.

SEROLOGY

It can be seen from table 1 that there were 24 persons who gave a positive serologic reaction out of 9,693 accepted—a rate of 0.249 per cent. Blood from these persons of course was discarded. This incidence is quite low but not unusually so when compared with figures gathered from similar volunteer services.²⁴ Each of these 24 persons was interviewed and none had any previous knowledge of having had syphilis. Inquiry regarding the history of syphilis is distasteful to some persons and with this group questioning regarding it would not have elicited any pertinent information.

TABLE 2.—Cause for Rejection

Cause	Donors
Low hemoglobin.....	40
Elevated temperature.....	27
Over or under age.....	61
History and physical findings.....	105
Miscellaneous.....	71
Total.....	307

There are at least 20 well authenticated cases in the literature of transmission of syphilis²⁵ by transfusion of whole blood when the donor's serologic reaction was negative. Recent work²⁶ has shown that it is doubtful

whether *Treponema pallidum* will survive three days' refrigeration at 5 C. The plasma collected in this project is refrigerated for at least two weeks at a temperature far below this. More recent work has shown further that when serum or plasma is desiccated²⁷ the organisms do not remain viable even when heavily infected specimens are tested. I believe that these data definitely rule out any possibility of the transmission of syphilis by the plasma that has been collected.

All dealings with the donor regarding a positive serologic reaction should be undertaken with the full recognition of the medicolegal complications involved. The word "syphilis" should not be mentioned in any written communications between the bleeding center and the processing plant or between the physician and the donor. Reports from the processing plant should simply state "Sample # — was found to be unsatisfactory." Every effort should be made to secure a second sample from the donor for a confirmatory test at another laboratory. The donor is then requested to give his written permission for the results to be forwarded to his personal physician. By dealing with the matter in this fashion, the physician in charge properly disposes of his public health obligations and terminates the physician-patient relationship that had been

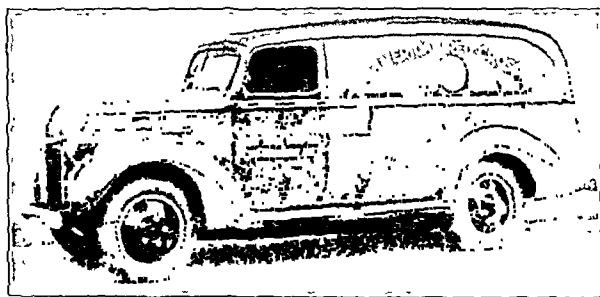


Fig. 3.—A standard 1 ton delivery truck is used as the ambulance for the mobile unit. This can carry equipment to take care of 200 donors.

established by the donor coming under his care at the bleeding center. Such a program has been successful without exception in this unit and has had no unpleasant sequelae.

CONTAMINATION

When material as highly susceptible as liquid plasma is being dealt with the problem of contamination is very real. The chief factors in the maintenance of sterility by the bleeding unit are:

1. The bleeding set should be autoclaved in a protective muslin covering so that the entire set may be kept sterile up to the time of its use.
2. No bleeding set should be used more than fourteen days after being autoclaved.
3. The containers used to ship the bleeding sets should be locked with wire seals.
4. If there is any question of a mechanical defect in any portion of the bleeding set, the set should be discarded.
5. A set should be discarded if any foreign body appears in the citrate solution or in the inlet tubing.
6. If either of the cotton filters are wet, the set should be discarded.
7. All palpation for difficult veins should be done before the arm is prepared, so that venepuncture may later be performed by a "nontouch" technic.

23. Duran-Jorda.⁶ Maisonneuve and Jeanneney.¹²
24. Greer, P. H.; Bracken, M. M., and Paul, E.: The Laughlin Test and Blood Donors, Canad. M. A. J. 42: 126-128 (Feb.) 1940.
25. Klauder, J. V., and Butterworth, Thomas: Accidental Transfusion of Syphilis by Blood Transfusion, Am. J. Syph., Gonorr. & Ven. Dis. 22: 652-666, 1937. Turner, T. B., and Discher, T. H.: Duration of Infectivity of *Treponema Pallidum* in Citrated Blood Stored Under Conditions Obtaining in Blood Banks, Bull. Johns Hopkins Hosp. 68: 269-279, 1941.
26. Bloch, Oscar, Jr.: Loss of Virulence of *Treponema Pallidum* in Citrated Blood at 5 °C., Bull. Johns Hopkins Hosp. 68: 412-415, 1941. Turner and Discher.

27. Turner, T. B.; Bauer, J. H., and Kluth, F. C.: The Viability of the *Spirochetes of Syphilis* and Yaws in Desiccated Blood Serum, Am. J. M. Sc. 202: 402, 1941.

8. A needle should not be used for more than a single penetration of the skin.

9. If an air leak or other mechanical defect appears during the course of bleeding, such a set should be referred for an individual sterility test.

10. The contamination rate rises in proportion to the number of persons performing the venesection.

11. The sterile material employed must be prepared by autoclaving at 250 C. for thirty minutes.

12. Absolute refrigeration control must be maintained from the time that the blood is taken until it reaches the processing plant.

13. Transportation should be so arranged that the plasma can be separated from the cells within forty-eight hours after the blood has been withdrawn from the donor.

14. The personnel should be on a full time basis. Volunteers should have no part in the actual bleeding of the donor.

By employing the "closed" system, many of the factors in contamination that are inherent in other types of bleeding sets are obviated. As simple as is the bleeding process with this technic and equipment, it is paramount that each small detail is meticulously adhered to. It is the accumulation of what may seem to be small and unimportant variations that produces contaminations.

No bactericidal or bacteriostatic agents, such as the drugs of the sulfonamide group,²⁸ have been used as a preservative for the blood as it is taken. Experimental work²⁹ carried out in connection with this project has cast considerable doubt on the efficacy of these drugs in eliminating contamination.

TABLE 3.—Donors Accepted

Month, 1941		Total	No Blood Obtained	Double Puncture	Fainted or Stayed Longer Than Usual Period
February	Male	381	3	18	30
	Female	447	11	22	17
March	Male	537	4	9	21
	Female	614	10	36	41
April	Male	638	..	17	25
	Female	461	6	18	35
May	Male	1,000	1	22	59
	Female	879	7	40	54
June	Male	914	4	15	41
	Female	905	10	31	57
July	Male	918	8	13	27
	Female	648	11	28	31
August	Male	420	1	6	13
	Female	385	2	14	9
September 2 to 17	Male	353	1	3	9
	Female	233	2	5	7
Totals	Male	5,121 (53%)	22 (0.429%)	103 (2.01%)	225 (4.39%)
	Female	4,572 (47%)	39 (1.29%)	194 (4.24%)	251 (5.49%)
Grand total.....		9,693 (100%)	61 (0.835%)	297 (3.076%)	476 (4.8%)

MOBILE UNIT

More than 40 per cent of the blood obtained by the New York bleeding center has been collected by a mobile unit. The personnel and the arrangements of the space available should be as similar as possible to those

outlined for the fixed group. This mobile unit has operated within a radius of 100 miles from New York. Bleeding has been done in factories, recreation rooms of office buildings and department stores, college infirmaries, community centers, woman's clubs, church parlors, hospital wards and in the open at the American Red Cross camps. The blood taken has been transported

TABLE 4.—Percentage of Loss of Bloods from All Causes

Out of Every 100 Donors
3.000 % rejected
0.810 no blood obtained
0.249 positive serology
0.743 breakage
1.200 contamination
6.002 %

over all types of terrain and during all seasons of the year. So far, there has been no more loss due to breakage, hemolysis or contamination than has occurred with the fixed group. The feasibility and necessity of establishing mobile units in war time is borne out by the experience of the British Transfusion Service.³⁰ Implications for its use in times of peace for civilians should be borne in mind. This has been previously suggested by DeGowin³¹ and by Strumia and McGraw³² for areas in which the population is highly decentralized.

No special material is necessary to equip the mobile unit other than the portable refrigerators. A standard 1 ton delivery truck (fig. 3) will carry material and refrigerating facilities for 200 donors. The equipment is identical with that of the fixed group, except that beds, chairs and tables are of the folding or collapsible type. Duplication of equipment and personnel gives complete flexibility to these two units and allows for some shifting of personnel, when a particularly heavy load is imposed on either one.

RESULTS

Table 1 gives a statistical summary of the experience with 10,000 persons who presented themselves as donors during the 178 bleeding days between Feb. 3 and Sept. 17, 1941. This is an average of 59 donors a day. At no time has the capacity of the unit been approached. The two units that have been in operation can easily handle 3,500 donors a month, working a five and one-half day week.

It will be noted that 307 prospective donors were rejected. The reasons for these refusals are noted in table 2.

It is interesting to compare the results obtained from the two sexes (table 3): 53 per cent of the donors were males and 47 per cent were females. Undoubtedly there are more females who present difficulties in venesection, but when the figures are broken down according to sex the technical difficulties encountered with the females are not nearly as impressive as might be expected.

In a project of this size it is necessary to determine how many full bleedings arrive in a usable condition at the processing plant as compared to the number of persons who come to give blood at the bleeding center. Such a figure includes losses from all sources. The bloods of 24 donors (0.249 per cent) were discarded because of a positive serologic reaction. Breakage in

28. R. F.: Sulfanilamide as a Preservative in Stored Blood, Brit. J. 1940. Novak, Milan: Preservation of Blood, J. A. M. A. 113: 2227-2229 (Dec. 16) 1939; The Derivatives as a Solution to the Problem of Bacterial Contamination, to be published. Becart, A., and Philippe, B.: The Use of Sulfanilamide; Advantages for Emergency Blood Donors, Especially in War Time, Presse med. 1941. 29. Heath, F. R., and Province, W. D.: Results of Studies on the Preservation of Human Plasma with the Sulfonamide Compounds, to be published.

30. Solandt, J.: The Army Blood Transfusion Service²⁰; also editorials referred to in footnote.¹¹ 31. DeGowin, E. L., and Hardin, R. C.: Plan for Collection, Transportation and Administration of Whole Blood and Plasma in Warfare, War Medicine 1: 326 (May) 1941. 32. Strumia, M. M., and McGraw, J. J.: Frozen and Dried Plasma for Civil and Military Use, J. A. M. A. 116: 2378-2383 (May 24) 1941.

handling at the bleeding unit, in transportation or in centrifuging accounted for the loss of seventy-two bottles (0.743 per cent). Fifty of these were lost in a single shipment which was improperly packed. With the type of equipment in use and the facilities for transportation now employed, the loss from breakage in the future should be negligible. Twenty-seven liters of plasma citrate mixture (1.2 per cent) was lost by contamination. This represents the blood from ninety-nine bleedings in two pools. The loss from all causes amounts to 6.002 per cent,³³ in other words, to have 100 usable bleedings at the processing plant approximately 106 donors must come to donate their blood (table 4). Although every effort is made to obtain a full bleeding from a donor, this is not always possible. It is necessary therefore to determine the average plasma-citrate yield from each bleeding. This was 273 cc. However, since 300 cc. of plasma is required to fill the final dispensing unit, it is necessary to have 109 usable bleedings to produce 100 units of dried plasma. If the 6 per cent loss previously mentioned is added, 115 donors are necessary to yield enough material for each 100 units of dried plasma-citrate mixture.

Presbyterian Hospital.

THE PRINCIPLE OF TRACTION IN THE TREATMENT OF URETEROLITHIASIS

ROY P. FINNEY, M.D.
SPARTANBURG, S. C.

Tiny calculi impacted in the pelvic segment of the ureter can be as tantalizing to the physician as they are agonizing to the patient. As a rule these curious pseudogeologic formations should be removed as quickly as possible, before the onset of certain painful and dangerous complications and/or sequelae.

The trouble one may encounter in extracting a stone from the ureter varies greatly and is wholly unpredictable. Thus a relatively small stone may require open operation, while another much larger may respond favorably to the slightest manipulation. This unpredictable behavior doubtless is the fault of the ureter, which from the standpoint of biomechanical efficiency leaves much to be desired. It is too small in caliber, too fragile and too keenly sensitive to reflex stimuli. A combination of these and other faults makes the removal of a stone by manipulation one of the most uncertain and often one of the most difficult procedures in medicine.

Dr. Hugh Hampton Young, first in so many beneficial contributions to the science of urology, was first to discover that a ureteral calculus may be made to pass by poking and prodding with instruments of various sorts inserted into the ureter by way of the newly invented cystoscope. His first success with this method came in 1902.

The passage of forty years has brought certain technical refinements and a dignified name to Dr. Young's original procedure. The physician may now select from a large number of ingenious instruments and an array of vastly improved cystoscopes. The method itself, in

which an operator has at the stone with unlimited stretchings, pokes and prods, is called "manipulation."

Manipulation is no doubt a valuable addition to genitourinary procedure. However, urologists differ considerably in their estimate of its worth. C. B. Squires, reporting on the treatment of 606 patients at the Crowell Clinic (1915 to 1930) said: "Manipulation was successful on 528 patients. Only 44 required open operation."

Likewise, Fowler and Champion have been highly successful with manipulation. In their office practice 76 per cent of patients responded to conservative treatment, an excellent record considering the fact that the patients usually continued work throughout treatment. Their favorite instruments were catheters and the spiral dislodger.

In contrast there is Higgins' review of 350 cases of ureteral calculi in which treatment was given at the Cleveland Clinic. Manipulation failed or was not attempted in 228 cases. However, the figures are misleading to any one unacquainted with Higgins' exceptional success in open operation. In 228 cases of ureterolithotomy he and his colleagues had a mortality of less than 1 per cent. It is but natural that they should be partial to open operation, using transurethral manipulation infrequently and with little faith.

Manipulation permits the greatest freedom in technic on the part of the operator, who may improvise to his heart's content. Every one who has mastered the use of the cystoscope has wished for an instrument with which he might safely grasp a calculus and pull it out of the ureter on the spot. To grasp and pull, that is the primitive, the satisfying way of getting a calculus or any desired object, and many ingenious types of forceps have been devised for the purpose. However, because of certain difficulties attending the use of a forceps in the human ureter, no dependable model has yet been constructed.

Briefly these difficulties are as follows:

1. A useful forceps must be rugged in construction, with strong serrated jaws. Yet it must be small and have a semiflexible shaft.

2. Since the forceps must grasp the stone blindly, some provision has to be made to prevent inclusion of the mucosa of the ureter.

3. Granted that these difficulties are solved, a really discouraging fact remains: Only extremely small calculi may be pulled through the ureter. A calculus as large as a 22 caliber bullet if pulled out at one manipulation will likely strip the ureter of much mucosa. Moreover, should a stricture be encountered, an overzealous operator may actually tear the ureter apart.

These observations are not wholly original. However, I did confirm them by a bit of research done some years ago. While engaged in it I became more and more skeptical about the use of a forceps in so delicate a structure as the ureter. In the end I became convinced that I had proved a fact of considerable importance, to wit: It is impossible to pull a calculus out of the ureter with a forceps. This means, of course, that all so-called ureteral forceps are useless. It is true that when the stone is engaged in the meatus and is visible one may deliver it with a forceps. But it is better to do a meatotomy instead.

Lack of space forbids a detailed description of my experiments, performed mostly on large dogs properly anesthetized. The procedure was as follows:

Having exposed and opened the ureters, I implanted calculi of varying sizes and shapes and attempted to

³³ Since the completion of this paper, it has been ascertained that 1 donor was diagnosed as having typhus fever forty-eight hours after he had given his blood, and it was felt that all the bleedings that had been pooled with his blood should be withdrawn. This adds a further loss of thirty six bloods.

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grasp them in forceps inserted transvesically from below. I used every type of grasping instrument that the ureter would receive. It was next to impossible to get a firm hold on the stones. On the few occasions when I did succeed a bit of mucosa was invariably included in the bite.

Next, by using one hand to steady the ureter and to manipulate the stone which it contained I was able to get a firm hold on the calculus without including the wall of the ureter. My object was to settle the important question of whether a stone cleanly grasped by a forceps may be pulled out of the ureter. The answer is no. Only the tiniest calculi would respond to reasonable traction, and even they produced serious trauma. Before the medium-sized and larger stones could be moved the ureter would tear.

By interposing a small scale between my hand and the forceps I could measure in pounds how much pull the ureter would take without tearing. All ureters withstood 5 pounds (2.3 Kg.), but none endured a pull of 10 pounds (4.5 Kg.).

Trauma, severe in every case, varied from more or less complete stripping of the mucosal layer to complete division of the ureter.

Having rejected the use of forceps as unsound, I turned to an idea which had occurred to me several years before but which had not been put to the test. It was to loop a ureteral catheter around the stone and use it as a medium for traction.

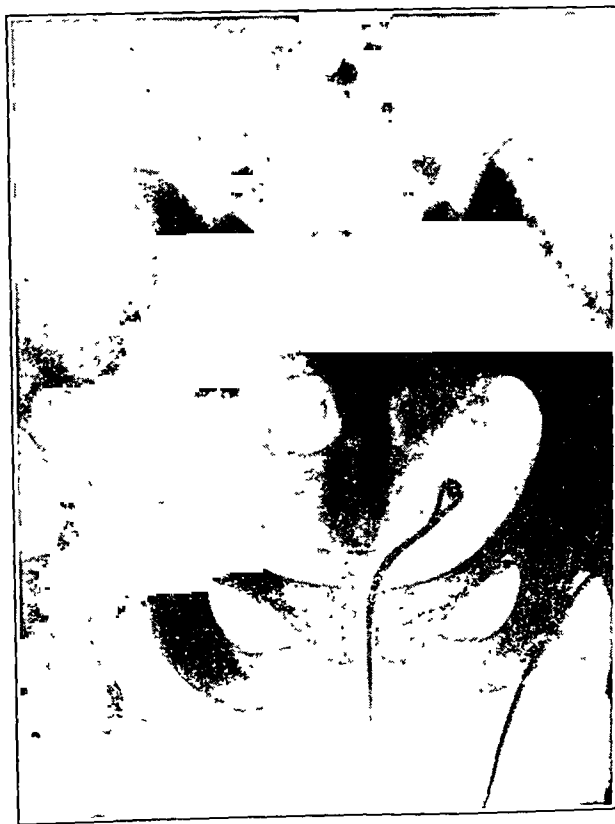


Fig. 1.—Calculus firmly held within loop. Intermittent traction delivered it in twelve hours.

There were several objections to this procedure. First, was it possible to lasso a foreign body wedged in so small a canal as the ureter? Second, what if success is so complete that having engaged the stone one finds it refusing to budge in any direction? Third, what of the trauma just described? Could it be avoided?

Happily, none of these objections were real. It is not difficult to lasso a stone in the ureter. As to the second objection, in 50 cases I did not encounter a calculus fixed so firmly in the ureter that it could not be dis-



Fig. 2.—Double loop caused by unintentional twist in catheter. Calculus engaged by proximal loop.

lodged. Some trauma was produced, of course, but in no instance was enough mucosa stripped from the ureter to delay recovery.

The technic is rather simple. In all but 5 of the 50 cases the stone was removed with a home-made instrument constructed as follows: A no. 6 F. x-ray catheter, with either a whistle tip or a taper tip, was modified by inserting a silk suture in the distal end, care being taken to tie the knot as small as possible.

A wire stilet should be inserted to stiffen the catheter, which is now ready for use. The catheter with thread attached is passed transvesically to the stone and beyond it if possible. Should it refuse to pass, a local anesthetic is injected and afterward a few drops of liquid petrolatum for lubrication. In nearly every instance the catheter will then pass with little difficulty. However, one will fail now and then in spite of patience and the use of a Blasucci tip. When this occurs one may often succeed by using spinal anesthesia, which does away with spasm as well as most of the pain. Only once in 50 cases was I unable to pass the stone.

If one has succeeded thus far, the thread-bearing catheter is moved on until the renal pelvis is reached. At this point the stilet is withdrawn a few inches and the cystoscope removed, the catheter being left in place. By pushing toward the kidney with the catheter and pulling away from it with the suture one may make a loop without difficulty or injury. There is plenty of room in the dilated renal pelvis. Once the loop has been made, thread and catheter are pulled down the ureter together until the stone is engaged in the loop. No doubt is experienced as to when this occurs, since firm resistance is encountered.

One now is in position to put as much traction as one wishes on the stone, for the loop rarely slips. It is best, I am sure, not to use more pull than 1 or 2 pounds (0.5 or 0.9 Kg.). However great the temptation, one must never try to remove the stone immediately. A small scale is attached to the end of the catheter, the patient is put to bed and pain is controlled by means of an opiate. The nurse is instructed to exert a pull of 2 pounds (0.9 Kg.) on the scale, maintaining it for a moment, every hour or two for twenty-four hours. At the end of that time the patient is given a bit of gas and a pull up to 5 pounds (2.3 Kg.) is made by the physician himself.

In my series of 50 cases the stone was obtained at the end of twenty-four hours in 47. Treatment was continued in the 3 cases of refractory calculi, being successful in 2, in which the stone was passed in thirty-four and forty-two hours respectively. The treatment in the third case was a failure. Having kept the loop in place for seventy-two hours without budging the calculus, I removed it by open operation. Failure was due to the unfavorable relationship of the greatest diameter of the stone to the lumen of the ureter and to the fact that it was actually embedded in the wall of the ureter.

SUMMARY

A new method of extracting ureteral calculi by means of traction is superior to methods now in use in the following respects: (a) A firm grasp on the stone may be had without including mucosa. (b) In contrast to older methods, only one cystoscopic treatment is necessary. (c) It is practically free from danger, provided the simple technic is followed with ordinary care.

134 Pine Street.

ABSTRACT OF DISCUSSION

DR. V. D. LESPINASSE, Chicago: I was interested to hear Dr. Finney's utilization of the loop. As I understand it, he makes his loop in the pelvis of the kidney. That is a neat little technical trick. A similar method was described about five or six years ago in the German urologic literature. The loop in the ureter was made right at the stone. If one is going to do that it must be necessary for the ureter to be large enough to make the turn or for the catheter to be supple enough so that it will not distend the ureter too much. This is the method I have used in five cases. It has worked very well and I have always obtained the stone. I have always checked the size of the ureter by urogram before attempting this procedure and I made various types of loops of various lengths. That is very important. The longer the loop, the larger the ureter must be in which to produce the loop. I have used for a good many years a method of my own concerning which Dr. A. J. Carlson, in commenting on it, said "Lespinasse, that is damned good physiology"; so I call it the physiologic method. I put an obstruction in the ureter and let the ureter dilate above the obstruction until it reaches the size of the stone and then remove the obstruction, and the stone comes down and out. About every six months for many years I have some instruments made to use in the ureter to enable the stone to pass. There is a small multiple curet that one can slide along past the stone, and if the stone has some bumps one can shave or chisel off these rough places, and then the stone will come along much faster. I want to congratulate the doctor on this experience and his experiments: I think they are very fine.

DR. GEORGE R. LIVERMORE, Memphis, Tenn.: I should like to sound a note of warning on intraureteral manipulation. Having been one who devised one of these instruments for the dislodgment of ureteral stones, I wish to go on record as condemning all metal instruments for promoting the removal of stones in the ureter. The ureter is easily damaged, and since

the introduction of American catheters, which are much stiffer than the ordinary catheter that we have been using, I find that puncture of the ureter is becoming much more frequent. Recently Heckel reported 15 cases in which the ureter had been punctured. After an experience of thirty years in urology I had my first puncture of a ureter using one of those stiff catheters. The patient had a stone in the ureter and I was attempting to pass the catheter beyond it. I don't think I have ever been accused of being rough in cystoscopic manipulations but I certainly did not use any excessive force in this case. Perhaps the pressure of a stone produces spots of necrosis or chronic inflammatory reaction and hence the ureter is much more susceptible to damage than otherwise. Dr. O'Connor some years ago suggested the use of prostigmine and reported good results by injecting prostigmine. My results, unfortunately, have not paralleled his. The most important factor, except the damage that may occur, is that one must be sure of the kidney function. If one can get a catheter by the side of the stone, it is much safer to leave the catheter in and drain the kidney rather than try to tie loops in it and pull the stone down. If one pulls on a stone one is apt to tear the ureter or damage its mucosa, irrespective of the experiments on dogs. Spinal anesthesia is another thing that one must be particularly careful of in handling these cases. There is no doubt that it causes relaxation, but it also stops the pain and therefore as my patient did not feel any pain and did not realize perhaps that I was using more force, I was able to push a catheter through the ureter. So please let's get away from intraureteral manipulation with other than soft catheters, leave the catheter in to drain the kidney and promote the passage of the stone and watch the function of the kidney.

DR. HERMON C. BUMPUS JR., Pasadena, Calif.: Dr. Finney should be congratulated on having manipulated 50 stones and encountered serious difficulty only once. This is an unusual record, for in the manipulation of ureteral stones one has the condition of urinary obstruction associated with infection, a combination that can result in the most serious of consequences. Dr. Livermore has emphasized the dangers of rupturing the ureter. I would emphasize those of infection in the presence of obstruction. Severe febrile reaction under these circumstances is likely to occur rapidly as a result of renal involvement, and septicemia not infrequently follows. For this reason it would seem imperative that one should inform the patient of these dangers before attempting manipulation and obtain his permission to resort to the surgical removal of the stone immediately if such untoward symptoms develop.

DR. ROY PELHAM FINNEY, Spartanburg, S. C.: I have to submit to authority in these cases, because you gentlemen have been practicing urology a great deal longer than I have. I did the first few operations with fear and trembling. I would not have undertaken the procedure had it not been for the fact that one gets tired of seeing certain patients once a week and over and over again subjecting them to the pain of "transurethral manipulation." This high sounding term too often means poking and prodding the stone at random. I thought that my loop around the stone would produce an obstruction and acute hydro-nephrosis. To my surprise, none of these cases showed any evidence of obstruction, save 1. On the contrary, the pain in the back was relieved as soon as the loop engaged the stone. This is not remarkable, since the loop acts as a dilator, keeping the walls of the ureter away from the stone. In the 1 case obstruction was complete. Relief, however, was easily obtained when I succeeded in passing a catheter to the renal pelvis without disturbing the loop. When possible I think it is well to do this at the time the loop is applied. I have used Dr. Livermore's instrument. I believe I have tried every instrument that has been devised for extracting ureteral stone. Perhaps I like this one better because it is mine. At any rate, it does work well and I did not get into any trouble in 50 cases. Now and then one may find it impossible to extract either the stone or the loop. What of it? One may be sure that a stone so tightly embedded will respond to nothing short of open operation. One operates. A pleasant surprise awaits you when beginning to feel for the stone. The loop will take one directly to it, especially if an assistant pulls a bit on the distal end.

THE USE OF SULFACETIMIDE IN BACILLARY INFECTIONS OF THE URINARY TRACT

FERDINAND WELEBIR, M.D.

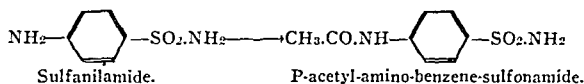
AND

ROGER W. BARNES, M.D.

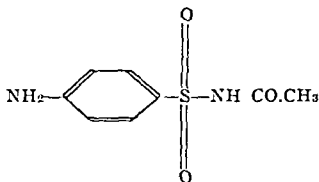
LOS ANGELES

Recent advances in chemotherapy have been of great benefit in the treatment of infections of the urinary tract. Research in chemotherapeutic agents, especially the sulfonamide compounds, is progressing rapidly. It has been our privilege to have under clinical investigation one of these drugs—sulfacetimide-Schering¹ (*p*-amino-benzene-sulfonyl-acetyl-imide)—which we have used with good results in the treatment of more than 200 cases of infections of the urinary tract due to the colon-aerogenes group of organisms.

In the vast amount of experimental work on sulfanilamide, it was found that it was acetylated in its passage through the body. This acetylation occurs at the amino group in the para position. Vonkennel and Korth² found that sulfanilamide when acetylated at this particular position became nontoxic but completely lost its therapeutic value.



In an effort to develop a compound which would still be relatively nontoxic yet hold its therapeutic effectiveness in the body, Dohrn and Diedrich³ succeeded in removing one of the hydrogen atoms of the sulfonamide group and placing the acetyl group in this position. The structural formula is:



This new compound has been used extensively in the British Empire and in Europe under the name "Albucid"; in the United States it has been under clinical investigation under the name "Sulamyd" (provisionally designated as preparation 338-A). It is supplied in tablets of 0.5 Gm. each.

As with sulfanilamide, the blood concentration and the elimination depend on the solubility and absorption of the compound from the gastrointestinal tract. Sulfacetimide has weakly acid properties owing to the hydrogen of the imido group as a result of acetylation in this position. Consequently, it readily forms easily soluble salts with the alkalis and, therefore, is rapidly absorbed from the gastrointestinal tract. It was found by Karbe⁴ that the average blood concentration during the course of administration (4.5 Gm. a day) was 3.1 mg. per hundred cubic centimeters and that there was

complete elimination of the compound six days after the last dose had been taken. Gertler,⁵ in his determinations, found that the blood concentration reached a maximum of 7.9 to 8.1 mg. per hundred cubic centimeters two hours after the oral administration of a single dose of 4 Gm. of the compound. A slight increase in the blood concentration could be expected during the administration of further doses; but after the drug was discontinued there was a rapid drop in the blood concentration, so that on the third day only traces could be found.

It is eliminated, in a large part unchanged, by way of the kidneys. Kidney function has a bearing on the elimination curve. Gertler reports a steep drop in the elimination curve only after discontinuance of the compound and that by the sixth day after the last dose has been taken the body is practically free of the sulfacetimide, except for possible traces on the seventh day. Dohrn and Diedrich found that approximately two thirds of the absorbed drug appears unchanged in the urine. This possibly accounts for the rapidity with which gram-negative bacilli are found to disappear from the urine.

In our clinical investigation we have used sulfacetimide only in the bacillary group of infections of the urinary tract. Each case presented gram-negative bacilli demonstrated in the urine either by stain or by culture. No value was placed on the *p*_H of the urine, as we found that sulfacetimide was as effective in acid as in alkaline urines. At first the course of treatment consisted of 34 0.5 Gm. tablets given in the following manner: 2 tablets after meals three times a day for three days, then 1 tablet after meals three times a day for two days and ending the course with 1 tablet twice a day for five days. The course lasted ten days. Later we found that a course of 15 Gm. was as effective in the large majority of cases; therefore, those treated toward the end of the series received the reduced dosage. In some cases in which a few bacteria persisted in the urine or recurred, smaller doses were continued over a longer period of time.

Gram stains or cultures and routine urinalyses were done every three or four days after the onset of treatment. This was carried out until from two to five or more negative stains or cultures were obtained. In ten cases frequent determinations of the blood count and hemoglobin changes during sulfacetimide therapy were made (table 1). In 1 case in this group side actions were complained of and in 2 other cases a prolonged term of therapy was required. We observed no tendency to leukopenia or other blood changes in our cases under treatment with sulfacetimide. In cases in which there was a leukocytosis from the infection preceding administration of sulfacetimide we noted a reduction to a relatively stationary level, and this continued throughout the course of treatment.

This report covers a series of 200 cases. Fifty-four additional dispensary cases in which initial complaints were limited to the bladder are not reported, for in these cases the patient failed to return after receiving the tablets; and it is probable that most of them received sufficient relief from their symptoms to make them feel that there was no need for further treatment. The drug was given each patient when gram-negative bacilli were found in the urine. Cystoscopy and a study of the kidney were done on the patients whose

From the Department of Urology, College of Medical Evangelists.
Read before the Section on Urology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.
1. The drug used for this study was supplied by the Medical Research Division, Schering Corporation, Bloomfield, N. J.
2. Vonkennel and Korth: Zur Chemotherapie der Gonorrhoe mit "Albucid." München. med. Wchnschr. 85: 2018 (Dec. 30) 1938.
3. Dohrn, M., and Diedrich, P.: Albucid, ein neues Sulfanilsäurederivat, München. med. Wchnschr. 85: 2017 (Dec. 30) 1938.
4. Karbe: Verhalten im Körper, unter Berücksichtigung Arch. f. Dermat. u. Syph. 17: . . .
5. Gertler, W.: Untersuchungen über die Höhe des Albucidblut- und Harnspiegels nach Albucidverabreichung bei Gonorrhoe und deren Bedeutung für den Heilerfolg, Klin. Wchnschr. 18: 1089 (Aug. 12) 1939.

presenting symptoms suggested an obstructive uropathy and those in whom the infection persisted while the drug was being administered, or recurred after it was discontinued.

The patients were divided into two groups: (1) those who complained of bladder symptoms only and presented

TABLE 1.—Blood Counts

Case	Hemo- globin, Per- centage	Red Blood Cells	White Blood Cells	Differential		
				Poly- mor- pho- nuc- lears, per Cent	Lym- pho- cytes, per Cent	Other Cells, per Cent
1 Acute pyelo- nephritis and cystitis	84*	4,880,000	19,000	91	5	4
	91	5,020,000	15,900	91	5	4
	91	5,020,000	11,400	83	9	8
	91	5,040,000	10,950	73	15	12
2 Acute pyelo- nephritis and cystitis	70*	3,350,000	20,150	84	11	5
	66	3,440,000	19,550	83	16	1
	70	3,580,000	11,500	87	7	6
	68	3,600,000	13,050	86	13	1
3 Chronic pyelo- nephritis and cystitis	86*	4,830,000	5,300	63	37	..
	88	4,280,000	5,250	62	..	..
	90	5,010,000	4,500	61	..	..
	90	4,980,000	4,600	..	..	..
	80	4,290,000	5,000	..	..	..
	77	4,830,000	5,300	..	..	..

* Before therapy.

no definite evidence of other disorder and (2) those in whom a pathologic condition in addition to an infection of the bladder was demonstrated. The patients listed in table 2 are those included in the first group. Many of them probably had a low grade infection of the upper urinary tract. With a few exceptions, the patients who are classified as "recovered" received only one course of treatment, whereas those who are classified as "improved" or "unimproved" required repeated courses or continuation of small doses of the drug to

TABLE 2.—Acute and Chronic Cystitis (No Evidence of Other Disorder): Ninety-Five Cases

	Acute Cystitis 40 Cases		Chronic Cystitis (to 20 Years) 55 Cases		Total 95 Cases *	
	Num- ber	Per Cent	Num- ber	Per Cent	Num- ber	Per Cent
Results						
Recovered.....	37	92.5	50	90.9	87	91.5
Improved.....	3	7.5	4	7.27	7	7.5
Unimproved.....	..	....	1	1.8	1	1.0
Total dosage	Grams		Grams		Grams	
Average.....	18.65		19.2		18.9	
Maximum.....	56.5		51.0		53.7	
Minimum.....	4.5		5.0		4.75	
Dosage in recovered cases						
Average.....	16.9		17.8		17.4	
Maximum.....	36.5		45.0		40.75	
Minimum.....	4.5		5.0		4.75	
Total days treated	Days		Days		Days	
Average.....	11.06		10.9		10.9	
Maximum.....	35.4		23.0		31.7	
Minimum.....	5.0		5.0		5.0	
Length of treatment in recovered cases						
Average.....	10.1		10.35		10.2	
Maximum.....	31.0		24.0		27.5	
Minimum.....	5.0		5.0		5.0	

* Reactions occurred in 3 cases.

prevent recurrence. It may thus be concluded that if recovery is to occur in a patient placed on this form of treatment, the first Gram stain taken three or four days after the onset of administration of the drug will give a relatively accurate prognosis. Some patients tolerated only small amounts of the compound yet

recovered on these smaller doses. The average dose for recovery was 17.4 Gm., the maximum dose 40.75 Gm. and the minimum dose 4.75 Gm. The average number of days required for recovery was ten and two-tenths, the maximum twenty-seven and five-tenths and the minimum five days.

Three side actions were noted during the administration of sulfacetimide in this group:

CASE 1.—A woman aged 32 complained of mild nausea, vomiting, dizziness, "inward trembling" and precordial palpitation, beginning four days after onset of therapy, a total of 10.5 Gm. having been given. The symptoms were so mild, however, that the drug was continued until she had taken 17 Gm. Immediately after completion of the course of treatment all symptoms disappeared, and on repeated Gram stain of catheterized specimens of urine no recurrence of the infecting bacilli was found.

CASE 2.—A woman aged 34 complained of a maculopapular itching rash covering the neck, chest and lower portion of the face which occurred on the second day of therapy after a total of 4 Gm. Medication was discontinued and the rash gradually improved and completely disappeared five days after its appearance. A similar reaction had been experienced with

TABLE 3.—Cystitis with Complications: One Hundred and Five Cases*

	Number	Per Cent
Results		
Recovered.....	84	80.0
Improved.....	18	17.1
Unimproved.....	3	2.8
Total dosage		Grams
Average.....		27.8
Maximum.....		80.0
Minimum.....		8.0
Dosage in recovered cases		
Average.....		28.1
Maximum.....		52.0
Minimum.....		8.0
Total days treated		Days
Average.....		15.2
" "		80.0
" "		4.0
Length of treatment in recovered cases		
Average.....		11.7
Maximum.....		34.0
Minimum.....		4.0

* Reactions occurred in 5 cases.

low sulfanilamide dosage. The urinary infection cleared up and subsequent specimens remained sterile.

CASE 3.—A woman aged 62 noticed on the second day of therapy, after a total of 4 Gm., an itching erythematous rash which appeared on the face and arms and also was distributed irregularly over the body. The drug was discontinued, and there was complete disappearance of the rash in four days. Repeated Gram stains of urine specimens remained negative.

The second group (table 3) comprises 105 cases diagnosed as acute or chronic cystitis in which the pathologic condition producing the infection was definitely diagnosed. These complicating factors were acute or chronic pyelonephritis, hydronephrosis due to ureteral stricture, benign hypertrophy of the prostate, chronic prostatitis, ureteral and renal calculi; carcinoma of the prostate and pregnancy complicated by pyelonephritis. Of these, 84, or 80 per cent, recovered; 18, or 17.1 per cent, showed definite improvement, and 3, or 2.8 per cent, were not benefited by the drug. Five patients had reactions. The average dose for recovery was 28.1 Gm., the maximum 52 Gm. and the minimum 8 Gm. The average length of time before recovery occurred was eleven and seven-tenths days, the maximum thirty-four days and the minimum four days.

In this group of infections of the combined upper and lower urinary tract, 20 patients received renal pelvic lavage in conjunction with sulfacetimide orally. Fourteen, or 70 per cent, of these patients recovered and 6, or 30 per cent, showed improvement. A group of 48 similar patients with infection of both the upper and the lower urinary tract received no therapy except the oral administration of sulfacetimide. Of these, 36, or 75 per cent, recovered and 12, or 25 per cent, showed improvement.

The 5 cases of side actions which occurred in group 2 are as follows:

CASE 4.—A man aged 66 had a bladder infection after transurethral resection for benign hypertrophy of the prostate. The patient was greatly debilitated and was a poor surgical risk. A total of 65.5 Gm. of sulfacetimide was given over a period of eighteen days. Nine days after the first dose he complained of an increase in the pulse rate, pain and depression about the precordial area. The dose was reduced from 0.5 Gm. three times a day to 0.5 Gm. twice a day, which lessened the symptoms; two days after the last dose had been taken all

course was repeated in smaller doses, but the rash immediately reappeared in the same areas. There was complete disappearance of the rash three days after the last dose had been taken.

Case 8 is reported in detail because of its interesting character:

CASE 8.—A man aged 34, with chronic pyelonephritis and chronic cystitis due to renal and ureteral calculi, had had severe reactions following the oral administration of sulfanilamide, the chief manifestation being a rash. The dosage was reduced but the rash would persistently reappear, no matter how small the amount given. He was then placed on a course of sulfacetimide. A two week rest period followed; during this time there was a constant shower of gram-negative bacilli in the urine and a recurrence of the costovertebral pain and symptoms of cystitis. At the end of this period he was started on a second course. On the second day he complained of mild cyanosis, dyspnea, general malaise and rash about the corona of the glans penis. The medication was discontinued and five days later there was no sign of the reaction.

The urine became crystal clear during administration of the sulfacetimide, and there was no evidence of the infecting

TABLE 4.—Reactions

Case	Sex	Age	Diagnosis	Grams Taken Before Reaction	Day Reaction Was First Observed	Total Grams Taken	Total Days Treated	Reaction	Comment
1	♀	32	Acute cystitis	10.5	4	17	5	Nausea, vomiting, dizziness, palpitation	Medication discontinued; reaction disappeared
2	♂	66	Chronic cystitis, benign prostatic hypertrophy, chronic prostatitis	16.5	8	26.5	16	Increased pulse rate, pain and precordial depression	Reaction disappeared when medication was discontinued; similar reaction with sulfathiazole
3	♀	23	Right pyelonephritis	8	4	8	4	Nausea, palpitation	Reaction disappeared two days after medication was discontinued
4	♀	39	Chronic cystitis and pyelonephritis	12	5	13	7	Erythematous rash on trunk and feet	Medication discontinued; rash disappeared five days later
5	♀	55	Cystitis, hydronephrosis	8	4	80	80	Nervousness, palpitation	Dosage reduced to b. i. d. caused less nervousness, medication continued until patient improved
6	♂	34	Ureteral calculus, chronic pyelonephritis	6	2	21.5	34	Mild cyanosis, dyspnea and malaise	Dosage reduced; reaction disappeared
7	♀	34	Chronic cystitis	4	4	4	2	Maculopapular itching rash on feet, neck and chest	Disappeared five days after medication discontinued; had same type rash with sulfanilamide; recovered from cystitis
8	♀	62	Chronic cystitis	4	2	4	2	Erythematous rash on face, arms and body patches	Medication discontinued; rash disappeared four days later; recovered from cystitis

symptoms of reaction disappeared. The patient complained of the same symptoms while he had been given sulfathiazole.

CASE 5.—A man aged 23 had pyelonephritis on the right side. The patient complained of nausea and palpitation when sulfanilamide was administered. He was started on 0.5 Gm. of sulfacetimide four times a day, and after he had taken it four days he complained of mild nausea and palpitation. The drug was discontinued and two days later there were no signs of reaction. He recovered from the infection and has remained well without further treatment.

CASE 6.—A woman aged 55 had infected hydronephrosis and cystitis. The patient had previously complained of nervousness, palpitation and malaise when sulfanilamide and sulfathiazole were administered. With the administration of the mandelates a rash developed. Four days after starting sulfacetimide she complained of nervousness and palpitation. She had taken 8 Gm. during this time, and the dosage was then reduced to 1 Gm. daily. The palpitation disappeared and there was a striking decrease of the nervousness. The patient continued therapy until there was a distinct improvement.

CASE 7.—A woman aged 39 had chronic cystitis and chronic pyelonephritis. Five days after the first dose of sulfacetimide, and after she took a total of 12 Gm., a mild erythematous rash developed on the trunk and feet. The drug was discontinued and five days later there was no evidence of the rash. The

bacilli. Immediately after discontinuance of the drug the urine became cloudy, and gram-negative bacilli were found.

A few days after all signs of the reaction had disappeared, the patient was placed on 0.125 Gm. twice a day. There was immediate and absolute relief from all symptoms, and the urine immediately became clear and sterile. The dosage was then increased to 0.25 Gm. twice a day, whereupon the entire group of symptoms reappeared and the former reaction recurred. The dosage was again lowered to $\frac{1}{4}$ tablet twice a day and the patient was without symptoms. After two months of the smaller dosage all medication was discontinued, and repeated examinations of the urine have shown no evidence of the previous infection, either by Gram stain or on culture.

In the entire series of 200 cases, we had 8 instances, or 4 per cent, of side actions (table 4). Five, or 62.5 per cent, had similar side actions with sulfanilamide or sulfathiazole. One patient noticed the first signs of reaction on the eighth day, after a total of 16.5 Gm. In 4 cases the reaction appeared on the fourth day, in 1 case on the fifth and in 2 cases on the second day. The average time before symptoms appeared was four and one-tenth days. The average amount of drug given before the reaction appeared was 10 Gm. One patient had neuritic symptoms with sulfanilamide, but when

medication was changed to sulfacetimide she had none. Three patients could not tolerate either sulfanilamide or sulfathiazole but had no ill effects from sulfacetimide.

Seven patients with acute pyelonephritis of pregnancy were treated. All were given an eight day course of 30 tablets (15 Gm.). In each case the urine became sterile three days after treatment was started, and after the course was finished the patients required no repetition of sulfacetimide. Chills, fever and pain disappeared immediately after the first day. Repeat stains of urinary sediment have all been negative, and deliveries have been uncomplicated. Two other patients treated post partum, and 1 after cesarean section, recovered.

Three children are included in this series. One child aged 5 years had been treated with mandelates, sulfanilamide and intramuscular azosulfamide with no reduction of the temperature nor elimination of the chills and fever. A dose of 0.25 Gm. of sulfacetimide was given twice a day for two days, and the course was completed with 0.25 Gm. once a day for five days. The chills, fever and costovertebral pain disappeared on the third day. The urine became sterile—after having had many pus cells and gram-negative bacilli for four months—and remained sterile on repeated examinations over a period of nine consecutive months. Two patients, each 10 years of age, recovered from acute attacks of infection of the lower part of the urinary tract with the administration of sulfacetimide and have been without symptoms for eight months.

In this group of 200 patients we found that 21 had been on sulfanilamide before sulfacetimide was given. Sulfanilamide was discontinued, either because of no response to the drug or because of reactions. After treatment with sulfacetimide, 17 patients were classed as recovered, 3 showed improvement and 1 did not respond. This is an 80.9 per cent improvement over sulfanilamide. Eleven patients who did not respond to the mandelates recovered with sulfacetimide, while 4 did not respond—a 73.3 per cent improvement over the mandelates. Three patients who did not respond to azosulfamide recovered on sulfacetimide therapy.

TABLE 5—Summary

	Number	Per Cent
Total number of cases	200	100.0
	171	85.5
	25	12.5
	4	2.0
Reactions	8	4.0

Six patients had previous sulfathiazole therapy: 2 could not tolerate it and 4 did not respond to it. These 6 patients recovered when placed on sulfacetimide therapy. Nine other patients who had taken some other form of oral therapy without response recovered when placed on sulfacetimide therapy.

SUMMARY

Two hundred cases of bacillary infection of the urinary tract were treated with sulfacetimide. The percentage of recoveries was 85.5; 12.5 per cent showed improvement and 2 per cent showed no response to the drug.

Sulfacetimide has been more effective in the treatment of these infections of the urinary tract than has sulfanilamide and the mandelates. In 80.9 per cent of the sulfanilamide-resistant cases recovery occurred when sulfacetimide was given; in 73.3 per cent of the mandelate-resistant cases and in all of the sulfathiazole-resistant cases recovery occurred.

There were toxic reactions in 4 per cent of patients in this series. After discontinuance of the drug, the reaction disappeared within a period of from one to six days.

The results of this clinical investigation show that sulfacetimide is effective and superior to other sulfonamides in the treatment of bacillary infections of the urinary tract.

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THE CHEMOTHERAPY OF GONORRHEAL URETHRITIS IN THE MALE

WILLIAM BROMME, M.D.

DETROIT

No group of therapeutic substances has gained such rapid and universal utilization as have the sulfonamides. It is undoubted that their advent has been the important therapeutic accession of the decade and that the control of many diseases caused by infectious agents now has been brought within the physician's grasp. It is equally true that there has developed a degree of uncertainty relative to the specific indications for the use of the sulfonamides, and in no part of the literature is this more evident than in the discussions of the treatment of gonococcal infection in the male.

Before the advent of the sulfonamides, how was gonorrhea cured? A host of chemicals and dyestuffs was given orally, first one and then another when the first seemed not to accomplish the desired result. A veritable flood of colored solutions was instilled onto the urethral mucosa or washed over its surface. Various vaccines were prepared from laboratory culture of strains of the organism. The human body containing the organism was exposed to high temperature. And time itself often cured the disease in those who put not their faith in doctors.

There is evident the same confusion today. There is one group of observers¹ which believes that sole reliance should not be placed on the sulfonamides but that the therapies once considered curative in themselves should be supplemented by the cautious use of these newer chemicals: this point of view bears consideration because of the extravagant claims proposed for other drugs which did not bear the test of time. A second group² holds that the risk of toxic symptoms from the use of the sulfonamides exceeds any possible benefit to be gained from them. The third, and by far the largest group,³ has observed the phenomenal and rapid cure of gonorrhea when the sulfonamides alone have been used, and series with cure rates as high as 96 per cent have been presented in evidence.

Read before the Section on Urology at the Ninety Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Kendall, H. W., Rose, D. L., and Simpson, W. M.: Combined Articular Fever Chemotherapy in Gonococcal Infections Resistant to Chemotherapy, *J. A. M. A.* **116**: 357 (Feb. 1) 1941. Pelouze, P. S.: Gonorrhea in the Male, *ibid.* **114**: 1878 (May 11) 1940. Pelouze, P. S., Churman, and others: Gonorrhea in the Male, *ibid.* **115**: 1630 (Nov. 9) 1940. Ballenger, E. G., in discussion in Symposium on Sulfanilamide, *J. Urol.* **41**: 69 (Jan.) 1939. Wolbarst, A. L., *ibid.*, p. 72. Colston, J. A. C., *ibid.*, p. 73.

2. Wersteb, Irvin: *Canad. M. A. J.* **40**: 389 (April) 1939. Culp, O. S.: Treatment of Gonorrhea with Sulfathiazole, *J. Urol.* **44**: 367 (Sept.) 1940. Burkholder, T. M., and Bang, Frederik: Use of Sulfathiazole and Sulfamethylthiazole in Treatment of Gonorrheal Urethritis, *ibid.* **44**: 541 (Oct.) 1940. Knight, F.; Uhle, C. A. W., and LaTosky, L. W.: The Treatment of Gonorrheal Urethritis in the Male with Sulfathiazole, *ibid.* **44**: 748 (Dec.) 1940. Van Slyke, C. J., Wolcott, R. R., and Mahoney, J. F.: The Chemotherapy of Gonococcal Infections, *J. A. M. A.* **116**: 276 (Jan. 25) 1941. Greig, C. H., Uren, J. L., and Mitchell, D. R.: Sulfathiazole Therapy of Gonorrhea, *Canad. M. A. J.* **44**: 237 (March) 1941. Diagnosis and Treatment of the Venereal Diseases, Circular Letter No. 18, Medical Preparedness, *J. A. M. A.* **116**: 2405 (May 24) 1941.

Pelouze⁴ recognized this uncertainty, and his statements made in 1928 are still valid:

A study of the disease gonorrhea will show that from the standpoint of pathology it holds a rather unique position among diseases. In other diseased conditions the question of pathology has held a large part of the field, so that before one considered the disease itself, he spent much time upon the pathology of it. With gonorrhea it has been entirely different. Though the pathologic picture has been a well completed one for at least twenty-five years, it has been lost sight of almost entirely in our considerations. Such a state is hard to understand, for there is no disease that can vie with gonorrhea in the survival of things which should have disappeared from its literature. No group of writers has been followed longer than those who early wrote upon gonorrhea. Indeed, it might be said with much truth that, if our grandfathers and possibly great grandfathers in medicine could come back and read what we have to say regarding the disease today, they would feel much at home. They would be little surprised over what we have added to their store of knowledge. Indeed, they would probably say that we have added little and lost much.

It seems well to review the nature and extent of the infectious process in the urethral wall:

The weight of evidence apparently shows that the mode of extension of the disease is by the surface progression of gonococci and not by subsurface transmission. Though it is a disease of surface penetration, it is apparent that this occurs perpendicularly to the surface. The bacteria pass between the epithelial cells into the submucosa, often as deeply as the trabeculae of the corpus spongiosum. . . . The speed of the penetration is great, so that by the end of thirty-six hours, they are well in the deeper submucosal spaces.⁵

In other words, this is a disease of the total urethral wall and not of the urethral surface. There is remarkably little evidence that any substance instilled onto the urethral mucosa ever cured gonorrhea except as an accessory to time or through nonspecific chemical stimulation. One recalls the classic report⁶ of the series in which a solution of tincture of capsicum was compared favorably with a 5 per cent solution of silver nucleinate: "The results were equally as good in this group of patients as were those obtainable in a like class of patients by the use of any germicide."

Neither in those days nor in this day can the surface application of an antiseptic to the urethra be considered curative. It seemed to me that valuable experience and perhaps a valid conclusion could be drawn from the exclusive oral use of one of the sulfonamides. To that end this series of 100 cases was prepared and is presented herewith

DRUG USED

Sulfathiazole (2-sulfanilamido-thiazole) was the sulfonamide used in this series. It appeared to be the derivative of choice in the treatment of gonococcal urethritis in the male⁷ on the basis of lessened risk of toxic

reaction and high therapeutic efficiency, although the more recent pyrimidine substitution form sulfadiazine may prove to be equally efficient.⁸

AGE AND OCCUPATION OF PATIENT

The average age of the group of 100 patients was 28 years. The oldest was 46 and the youngest was 22.

These men were employed in the heavy industries in which the expenditure of physical energy is great. It was desirable that none lose time from their work because of intercurrent infection.

PREVIOUS INFECTION

Forty per cent of the series had experienced one or more previous attacks of gonococcal infection. This factor is noted in an attempt to discover whether or not there remained any point in following the dictum that one attack so changes the epithelial character of the urethra that subsequent attacks bear a different clinical pattern. No such correlation was observed.

ONSET OF SYMPTOMS

The evidence of urethral irritation appeared uniformly four days after exposure. This is the general incubation period for the common strains of the organism. The fact that 36 per cent of the series had used samples of the host of commercial prophylactics and yet contracted the infection defies critical analysis

PREVIOUS SULFONAMIDE THERAPY

Thirty-six per cent of the group had received treatment with sulfanilamide before they became part of this series. The dose of sulfanilamide had ranged from 1 to 3 Gm. daily and had been continued from seven to forty-nine days without alteration of the clinical evidence of the disease. The total dose of sulfanilamide involved ranged from 9 to 49 Gm.

CRITERIA OF INFECTION

In every case there was present a urethral discharge in an inflamed, edematous urethral canal. Stain of the urethral discharge revealed gram-negative intracellular diplococci in all cases. The first glass of urine was cloudy or turbid in all cases. The second glass of urine was cloudy or hazy in 70 per cent, indicating, traditionally at least, posterior urethral involvement. All were cases technically of acute gonococcal urethritis. The prostatic fluid presented a significantly increased cell count in 35 per cent of the cases, and the organism was identified in smears of the prostatic fluid in 15 per cent of the total series.

DOSAGE OF SULTATHIAZOLE

The total initial daily dose varied between 3 and 7 Gm., the average approximating 4 Gm., which was the actual daily dose for most of the series. This daily dose of 4 Gm. was divided in four parts and given at approximately equal intervals during the hours of the patient's activity. This dosage was maintained from two to eight days, the average being somewhat less than five days until cure was attained, although the same dosage was maintained from one to two days after evidence of the disease had disappeared. The average total dose for this period was 18.4 Gm.

Forty per cent of the series required no further sulfathiazole because smears had become negative within

4 Pelouze, P. S. *Gonococcal Urethritis in the Male*, ed 1, Philadelphia, W. B. Saunders Company, 1928, p. 64.

5 Pelouze, *Gonococcal Urethritis in the Male*, page 67.

6 Pelouze, *Gonococcal Urethritis in the Male*, page 137.

7 Long, P. H.; Haviland, J. W., Edwards, Lydia B., and Bliss, Eleanor A. *The Toxic Manifestations of Sulfanilamide and Its Derivatives*, J. A. M. A. 115: 364 (Aug 3) 1940. Lloyd, V. E., and Erskine, David. *Treatment of Gonorrhea*, Lancet 2: 186 (Aug 17) 1940. Mahoney, J. F.; Wolcott, R. R., and Van Slyke, C. J. *Sulfamethythiazole and Sulfathiazole: Therapy of Gonococcal Infections*, Am. J. Syph., Gonorr. & Ven. Dis. 24: 613 (Sept.) 1940. Spink, W. W., and Hansen, Arild. *Sulfathiazole: Clinical Evaluation*, J. A. M. A. 115: 840 (Sept 7) 1940. Carroll, Grayson, Kappel, Louis, and Lewis, Bransford. *Sulfathiazole: Clinical Investigations*, ibid 115: 1350 (Oct 19) 1940. Barlow, O. W., and Chimenko, D. R. *Studies on the Pharmacology of Sulfapyridine and Sulfathiazole*, ibid 115: 282 (Jan 25) 1941. Flippin, H. P.; Reinhold, J. G., and Schwartz, Leon. *Sulfapyridine and Sulfathiazole Therapy in Pneumococcal Pneumonia*, ibid 116: 683 (Feb 22) 1941. Strauss, Elias, Lovell, E. C., Taylor, F. H. L., and Finland, J. *Excretion and Distribution of Sulfanilamide, and Sulfamethythiazole*, Ann. Int. Med. 14: 211 (April) 1941. *The Treatment of Gonorrhea in the Male*, J. Urol. 45: 636 (April) 1941.

8 Long, P. H., Marshall, E. K., and Janeway, C. A.: *Sulfanilamide and Related Compounds*. Panel Discussion, Twenty-Fifth Annual Session, American College of Physicians, Boston, April 23, 1941.

this period and had remained negative for a thirty day period of observation following the first negative smear. On the average, negative smears were obtained within three days on 4 Gm. daily.

Sixty per cent of the series required further doses of sulfathiazole for cure, and the average additional amount of the drug was 8.2 Gm., which represents slightly more than two days of additional medication. One half of this group represented patients who had received sulfanilamide previously. The smallest dose of sulfathiazole received by any patient was 9 Gm. and the largest 33 Gm.

CRITERIA OF CURE

The diagnosis of cure was based on (1) inability to find a urethral discharge for staining purposes and (2) persistently negative culture of the urine in the face of traditionally provocative tests. In all cases the ingestion of alcohol was utilized as a provocative measure and, in quite a number, protected coitus (and I suppose in a certain number unprotected coitus). In a few instances a steel sound was passed, but in no instance was an irritating chemical instilled into the urethra. The utilization of these traumatizing procedures is a part of the historical past of the treatment of gonococcal infection in the male.

RESULTS

The period of actual therapy and close observation included a period of three to thirteen days, and in this time 100 per cent of the series was cured. All were observed for an additional thirty day period. There was no increased period of treatment for those who had previously had a gonococcal infection. The 36 per cent who had previously received sulfanilamide and were transferred to sulfathiazole without a waiting period were cured with the same average amount of sulfathiazole and within the same period as those who had had no experience previously with the sulfonamides. There were no incapacitating reactions and no complicating sequelae of the disease.

COMPLICATIONS

The complications observed in the modern management of acute gonococcal infection in the male are of two types. The first derives from the tendency of the disease to spread centrally to involve the prostatic urethra, prostate gland, seminal vesicles, vasa, epididymides and the deeper para-urethral structures. This tendency is an inherent one in the disease; it can occur spontaneously but it has been demonstrated repeatedly to occur more frequently when the pressure of retrogradely injected material exceeded the ability of the tissues to oppose that force. Since no local medication was utilized in this series, and since the organism had disappeared in a reasonably short period of time, it was not at all surprising to find that there were no local complications of the disease and no reason to anticipate the development of stricture in the future. Three patients (3 per cent) presented prostatic fluid cell counts in excess of the normal range, but culture of the fluid was negative for gonococci one month after the patient had been declared cured by standard criteria. I am not certain that these patients had not possessed a nonspecific prostatitis antecedent to their acute gonorrhea. At all events, they did not have a gonorrheal prostatitis. There were no complications involving hematogenous spread of the organism.

There is a second series of complications related to the administration of the drug. The literature has described dermatitis,⁹ nausea, vomiting, headache, dizziness, hematuria, oliguria or anuria and anemia. These signs seem to be associated in variable degree with the administration of all sulfonamides. There seems to be no relation between either the dosage or the duration of treatment and the appearance of one or many of the toxic reactions to the drug used. In this series 23 per cent of the patients complained of variable nausea, but there was no vomiting. Five per cent manifested elevation of temperature with a recorded peak of 100.6 F.; these were all men who had received sulfanilamide previously, and the fever appeared toward the end of the course of intensive 4 Gm. daily of sulfathiazole. In 1 patient a diffuse, discrete, pruritic, papular cutaneous eruption developed which ultimately was demonstrated to be scabies. There were no instances of hematuria, oliguria, anuria or suggestion of tubular blockage by crystallization of the excretion product in the kidney. I had been influenced by the work of Curtis,¹⁰ which suggested that a prime factor in the maintenance in solution of the excretion product was an alkaline urine and, accordingly, I ordered for the entire series the concurrent administration of a urinary alkalizer (a citrate) orally. Likewise, the experience of Wilson at the Children's Hospital of Michigan¹¹ with regard to maintenance of an adequate volume of fluid intake was accepted, and all in this series were urged to force fluids to capacity. Marshall⁸ has noted that the urine of nearly every patient placed on sulfathiazole therapy will show quantities of crystals of acetylsulfathiazole if it is kept iced for four hours. I observed no crystallization in the freshly voided urine and felt that the combination of alkalinized urine of moderate dilution was a safeguard against crystallization of the excretion product within renal tubules.

No patient lost time from work. A few noted transient headache but were not incapacitated by it.

COMMENT

This series did much to convince me that there has developed a needless confusion in the minds of those who treat acute gonococcal infection in the male. This might well be a time to revise the program of treatment to exclude those things which have been done traditionally and which apparently have no further justification for their perpetuation. With the advent of a series of drugs, of which sulfathiazole is the current example, which are in themselves capable of curing gonococcal infection, there seems to be little justification for the continued use of other routines in conjunction with the sulfonamides, especially when the time limit to achieve cure on sulfonamide therapy is infinitely shorter than with any other known therapeutic agent. Why must one run the rainbow of colors in dyestuffs and percentage strengths of silver proteinate in the archaic procedure of instillation onto the surface of the urethral mucosa when the active infection is far deeper than will ever be reached by this method? Why is this routine perpetuated which is not based, after all, on an understanding of the pathologic nature of the disease? One can filter into those tissues which harbor the gonococcus a medication which is lethal to it. Nesbit has shown that the action of the drug is

9. Volini, I. F.; Levitt, R. O., and O'Neil, H. B.: Cutaneous and Conjunctival Manifestations of Sulfathiazole Intoxication, *J. A. M. A.* 116: 938 (March 8) 1941.

10. Curtis, A. C.: Personal communication to the author.

11. Wilson, James L.: Personal communication to the author.

in the tissues and not in the excretion products eliminated in the urine.¹²

The complications observed in this series were in no sense critical or disabling and offered no contraindication to continuation of therapy. The literature does report high temperature, extensive dermatitis, conjunctivitis and evidence of renal interference, and had these appeared in my series I probably would have discontinued the drug. But the weight of evidence is that these manifestations of intolerance by the patient come late in the course of protracted therapy.

I have a feeling that the dosage must be high from the start. There is no justification for a dosage schedule which tends to start at a low level and then builds up to what is known to be an adequate dose. If there is anything to the notion that organisms can become tolerant to a chemical so that they become resistant ultimately to its action, there is no better method of inducing this unfortunate state than by trying out inadequate doses initially. I suspect that what are called "sulfonamide-resistant" strains of organisms have become so by virtue of the use of too cautious dosage. As a matter of fact, the 36 per cent of this series who had been exposed to sulfanilamide without therapeutic response and were thus to be considered "sulfonamide resistant" were placed without a rest period on adequate doses of sulfathiazole and were cured at exactly the same rate and with the same average doses as those who had not received a sulfonamide previously. Thus I cannot take too seriously this matter of alleged induced resistance to the drug without wondering what might have happened if the dose of the drug had been within the range of actual therapeutic efficiency.

A word of comment is in order regarding the matter of the evaluation of the progress of therapy through repeated determinations of the blood level.¹³ Through the first third of the series I studied examinations of the blood level only to find a wide variation in the reports. It soon became evident that I was not altering the dose of the drug in those whose blood level was lower or higher than the average. It became equally obvious that the interpretation of clinical conditions meant considerably more in the management of each case. There was no instance in which the summation of clinical signs proved undependable, and with the wealth of information to be gained from the study of the urethral discharge and the urine I abandoned further routine determinations of the blood level as a thoroughly unnecessary additional expense to the patient.

Finally, it must be remembered that there has always been a sharp increment in the incidence of the venereal infections with the congregation of large numbers of our youth in cantonments. Unlike 1917, the physician has at his disposal a drug which is a safe, speedy, non-traumatizing and certain treatment for gonococcal infection in the male. With this form of management of the infected, the physician's experience should be much happier than it was during the first World War.

CONCLUSIONS

1. Sulfathiazole is capable of curing gonococcal urethritis in the male quickly when administered orally in doses of 4 Gm. daily. This dosage should be continued for a time after there is clinical and bacteriologic evidence of cure.

2. On this dosage, the appearance of complications due to drug toxicity are rare and should not impel one to shun the drug.

3. The estimation of the blood level in the face of easily obtained clinical evidence is an unnecessary procedure.

4. Traditional adjuvant routines of therapy are not necessary.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRs. WELEBIR AND BARNES
AND DR. BROMME

DR. EDWARD NOBLE COOK, Rochester, Minn.: I was impressed with the fact that the dosage used by Drs. Welebir and Barnes is not excessively high. Many of us found that the 75, 90, 120 and 150 grain (5, 6, 8 and 10 Gm.) doses daily were not necessary. Drs. Welebir and Barnes have found that a dosage of 20 to 30 or 40 grains (1.3, 2 or 2.6 Gm.) a day will take care of most of these infections. I have found that in the simple bacillary infections confined to the bladder the percentage cure rate is high. Even though the involvement may extend to the kidneys, provided there is not extensive pathologic change, the percentage cure rate is little changed. I might take exception to what Drs. Welebir and Barnes stated with regard to comparing sulfacetimide with mandelic acid or some of the other sulfanilamide compounds. All have had the experience in which we have used one or two courses of sulfanilamide and then given it a third time and, much to our surprise, eradicated the infection without a great deal of difficulty. I was interested in the fact that 70 per cent of Dr. Bromme's patients, when they first came to him, had posterior involvement. Yet the cure was just as high in this group as in the group without posterior involvement. He too has found that a medium sized dose is sufficient, that the 75 to 120 grain (5 to 8 Gm.) doses have not been necessary. In his series there have been no complications. In a small group of patients I have not seen complications. It is rare now to see a gonorrheal epididymitis or a periurethral abscess. The economic value of these drugs can only be estimated, but it must run into millions of dollars when one considers the time and the effort saved. Dr. Bromme has called attention to the importance of the clinical observation of the patient. I have found much the same thing. The blood concentrations aren't necessary; if one will see the patient every day or two one will not have to resort to all of these tests, which increase the cost of care to the patient and do little as far as his ultimate recovery is concerned.

DR. EDWIN PASCAL ALYEA, Durham, N. C.: In Dr. Bromme's paper one finds still another proof of the efficacy of sulfathiazole in the treatment of gonococcal infections. His cure rate is 100 per cent. I wish we had the "Detroit strain" of gonococcus in North Carolina. In 1937 it was shown that large doses of sulfonamide drugs and high blood concentrations were not necessary for a cure in gonorrhea. Since then this has been verified many times. Recently Mahoney reported a large series of cases treated with sulfathiazole; one group received 2 Gm. a day; another group received 4 Gm. a day; the cure rate, 90 per cent, was exactly the same in the two series. The adequacy of Dr. Bromme's therapy should be questioned. As is shown by his own series, 60 per cent of those stopped in forty-eight hours needed further treatment. I favor the following scheme of therapy: Three Gm. of sulfathiazole is given the first day and 2 Gm. a day thereafter for nine days. If, after the fourth day, there is no response, the drug is switched to similar doses of sulfapyridine. This is given for seven days. If there is no response to sulfapyridine in four days, switch to sulfanilamide or discontinue sulfonamide therapy. As to criteria for cure, in addition to Dr. Bromme's recommendations I think it is necessary that prostatic cultures be made every two weeks until at least four negative cultures for gonococci are obtained. In addition to this, patients should have the "probable cure"; namely, (1) no urethral discharge for two months; (2) four

12. Nesbit, R. M.: Observations on the Site of Action of Sulfapyridine in Gonorrhea, *J. Urol.* 44: 242 (Aug.) 1940.
13. Cook, E. N.: Chemotherapy in Urology, *J. A. M. A.* 115: 2079 (Dec. 14) 1940.

prostatic secretions, examined one week apart, to have not more than ten leukocytes per high power field, and stained smear negative for gonococci; (3) four urine specimens one week apart, first glass clear, no leukocytes in centrifuged microscopic test and no gonococci in the stained smear. Drs. Welebir and Barnes state that in the complicated cases the dosage must be raised for cures. My associates and I did not find that such augmentation, in the case of the other sulfonamide drugs, increased our cures. If the complication present was not first treated, they have indeed a high percentage of cures, 80 per cent, much higher than we and others have obtained with any of the other sulfonamide drugs. As for the uncomplicated cases, their 91 per cent cures are slightly higher than we obtained with sulfapyridine for the treatment of colon bacillus infection, 88 per cent, and considerably higher than sulfathiazole, 77 per cent, and sulfanilamide, 80.6 per cent.

DR. W. RAY JONES, Seattle: There is a reason for the failure of sulfonamide therapy seldom considered; pus and exudate contain a substance which will neutralize the action of the drug in a greater concentration than it is possible to get the sulfonamides in solution. Hence, if there are focal abscesses, there must be recurrences when these open and drain. To illustrate, here in the gross is an infection of the paraurethral glands, the female prostate with a pouting meatus, and so on. This case developed during sulfonamide therapy for gonorrheal urethritis. The various crypts and follicles may become infected and a closed abscess result. The suburethral glands likewise may serve as foci to be uninfluenced by sulfonamide therapy until evacuated. My plea is to examine carefully for all possible nondraining infected areas before pronouncing the patient cured, else an unexplained recurrence will probably result due to infection of these various crypts and follicles.

DR. VICTOR D. LESPINASSE, Chicago: The highest possible concentration of drug should be obtained in the location where the bacteria are. The drug can be placed in the mouth or injected into the veins and it goes into the blood stream, but if it is injected into the urethra as well the drug will be on both sides of the organism. It surrounds the organism and engulfs the organisms in the urethral cavity. Nobody can deny that they are there; and there is no irritation from these drugs. My plea is to inject into the urethra as strong a solution of sulfathiazole or sulfanilamide as is possible to make in water in addition to use of the drug by mouth. I think that the results will be better than they are if one limits oneself to the use of the drug by mouth, subcutaneously or intravenously.

DR. WALTER M. SIMPSON, Dayton, Ohio: My associates and I have encountered an apparently irreducible residue of therapeutic failures, even with sulfathiazole. In our experience, based on rigid bacteriologic criteria, about 12 per cent of patients with gonococcal infection fail to respond successfully to presumably adequate sulfathiazole therapy. In a paper published in *THE JOURNAL*, February 1, we described a procedure directed toward the rapid elimination of such refractory gonococcal infections by the utilization of a single session of artificial fever combined with chemotherapy. It was found that any of the sulfonamide drugs (sulfanilamide, sulfapyridine, promin or sulfathiazole) given concurrently with therapeutic fever had no advantages over fever alone. We concluded that there is a latent period in the action of the sulfonamide compounds, the average of which is about eighteen hours. Therefore, in order to obtain the maximum response to the single fever treatment it is necessary to give the drug in reasonably high doses for eighteen hours prior to the fever session. In the report in *THE JOURNAL* we suggested a ten hour session of fever at 106.6 F. Our more recent studies, soon to be described in *War Medicine*, reveal that with sulfathiazole or promin given eighteen hours prior to a single fever session it is possible to reduce the number of hours of fever to eight and to reduce the rectal temperature level to 106 F. Thus far, such a combined program has resulted in 100 per cent elimination of the disease in chemoresistant cases. What was looked on as a technical feat a decade ago as regards the administration of fever therapy can now be prescribed with a regularity which approaches routine, owing to the remarkable improvements in the technics and in the apparatus for fever therapy. We are particularly interested in the relation of this

procedure to military medicine. We feel that the stated mission of the United States Navy, "to keep as many men at as many guns as many days as possible," can be fulfilled as regards resistant gonococcal infections. The period of hospitalization necessary for this combined method of treatment is forty-eight hours. We feel, therefore, that if this procedure is surrounded by the necessary safeguards as regards well trained personnel and efficient apparatus it provides a simple, safe, cheap and certain method for the eradication of the gonococcal infections known to be refractory to the chemotherapeutic agents now available.

DR. ROGER W. BARNES, Los Angeles: As many urologists have probably used sulfacetamide, I wish to say a word to identify it more clearly. It is preparation 338-A, Schering, the chemical name which has been accepted being sulfacetamide. The term "Sulamyd" is Schering's trade name, and it was the Medical Research Division of Schering Corporation which supplied us with the drug we used. It is not as yet on the market because it has not been passed by the Food and Drug Administration, but it probably will be on the market in a few months. Of the eight reactions in this series of 200 cases, all were mild, and we did not have to hospitalize any patients with reactions. In 4 of them the drug was discontinued, and in 4 others, when the dosage was reduced, the reactions became less, so the medication was continued until the original infection was controlled. Dr. Alyea remarked on the higher percentage of recoveries which we reported from the use of this drug than he had obtained from other sulfonamides. I believe that all urologists will find this to be true when they use it in bacillary urinary tract infections. We found it to be less efficacious in clearing up coccic infections than sulfathiazole and sulfapyridine. In fact, in a number of cases in which there were mixed infections we found that the gram negative rods cleared up with the sulfacetamide, whereas the coccic infections did not. I believe that cystoscopy and a kidney study are not necessary in every case in which there is pus in the urine. Many of these cases will clear up without this manipulation, and in 95 of the cases in our series, studies of the upper urinary tract were not made. Only in the cases in which the infection persisted or recurred was more thorough study made. The cases in the second group, "cystitis with complications," included all in which there was another pathologic condition besides the infection. In these the complicating pathologic condition was treated while the drug was being given. The patients whose infection cleared up and who remained well after the drug was given and the complications removed were counted as recoveries, whereas if for some reason the complication could not be treated and the infection cleared up with the use of the drug but then recurred they were listed as improved. There were 12.5 per cent improved in this group and most of these cases were those in which the infection cleared up originally and then recurred after the medication was stopped.

DR. WILLIAM BROMME, Detroit: I think Dr. Cook and Dr. Alyea and I see eye to eye with regard to the premises that these drugs can kill the organism and that we no longer have to place medications in the urethra to cure the disease. But I do not believe the daily dosage of 3 Gm. is adequate. With that amount we shall see complications and a protracted clinical course. The dosage must be large from the start and kept large until there is bacteriologic evidence of cure. I am glad that Dr. Alyea repeated the necessity of meticulous supervision of details and bacteriologic control. I was much stimulated by Dr. Ray Jones's demonstration in the Scientific Exhibit. I see no gonorrhea in females, but I think we must assume from now on that, when glands do not drain and when periurethral abscesses form, something has gone wrong with our basic therapy. When we do not administer sufficient drug to overwhelm the organism we must anticipate the development of undrained areas which will require, as they have in the past, a mechanical method of drainage. Dr. Lespinasse's remarks about large doses is the bedrock of the whole story. No case in my series required fever therapy and I am unable to comment on Dr. Simpson's extensive experience with this adjuvant therapy. His dosage of sulfathiazole approximates the dosage which was curative in a large part of my series.

THE USE OF COTTON AS A
SUTURE MATERIALWITH PARTICULAR REFERENCE TO ITS
CLINICAL APPLICATIONWILLIAM H. MEADE, M.D.
EAST LANSING, MICH.

AND

CARROLL H. LONG, M.D.
NEW ORLEANS

Fundamentally, surgeons are interested in methods and materials which lead to primary and early wound healing. Dissatisfaction with the results obtained with catgut as a suture material has led to a renewal of interest in nonabsorbable sutures during the past decade. After Bulloch and his co-workers¹ in Great Britain, Kronig² in Germany and Meleney and his associates³ and Clock⁴ in this country had demonstrated that catgut purchased on the open market was not infrequently contaminated, Whipple,⁵ who had previously used catgut, strongly advocated the use of silk, with which he was able to show a reduced incidence of infections in clean wounds. This work gave a new impetus to the use of nonabsorbable suture material, a usage initiated in modern surgery by Halsted⁶ and Kocher⁷ at the end of the last century.

There exists venerable authority for the use of cotton as surgical sutures in Suśruta's recommendation of cotton for the suture of wounds of the abdomen and joints about 500 B. C. Gage⁸ and Guerry⁹ have employed fine cotton for ligatures on an empiric basis for many years. In 1939 Meade and Oschner,¹⁰ in a previously reported exhaustive experimental study, demonstrated cotton suture material to incorporate the desirable qualities of pliability, satisfactory tensile strength, a high coefficient of friction, stability on exposure to heat or moisture and failure to produce tissue reaction. They undertook the comparative study of cotton, silk, linen and catgut with regard to tensile strength, tissue reaction, wound healing and bacterial contamination. Straight and knotted segments of these materials were tested before and after sterilization. Similar unreported studies were made with nylon. It was clearly demonstrated that whereas dry, unsterilized cotton has less tensile strength, size for size, than cat-

gut, silk or linen, its tensile strength is less altered by sterilization than is that of other suture materials, and after implantation in the tissues it showed much less impairment of tensile strength than did any of the others. Furthermore, when placed in tissue cotton did not cause edema or allergic responses and stimulated less cellular tissue reaction than other suture materials. Apparently its compact structure prevented ingrowth of tissue and thereby lessened the incidence of suture sinuses, common with the use of silk. It was found that sinuses were much more frequent when continuous sutures were employed than when interrupted sutures were used, probably because infections were able to traverse the entire wound along the tract formed by the continuous suture. Cotton was easily sterilized by being boiled in water for twenty minutes or autoclaved for fifteen minutes at 15 pounds (6.8 Kg.) pressure.

The preparation of cotton for clinical use will be presented more fully in a subsequent paper. However, it should be emphasized that cotton should not be sterilized on rigid spools. As previously demonstrated by Meade and Oschner, cotton contracts when heated, and if it is sterilized on a rigid spool the fibers are weakened or even ruptured, which materially decreases the tensile strength of the suture. The cotton suture should be rewound loosely on soft rubber tubing or should be rolled in small skeins of convenient size which can be placed in test tubes before sterilization.

Although we are convinced that cotton is tolerated better by tissues than silk and can be used more safely in the presence of gross contamination and infection, we are of the definite opinion that the tenets laid down by Halsted⁶ for the use of silk should apply also to the use of cotton. Halsted emphasized that: (1) only interrupted sutures should be used, (2) coarse suture material should be avoided by the use of a greater number of finer suture materials, (3) a dead space should never be bridged over as a chord subtends an arc and (4) the combined use of absorbable and nonabsorbable material should be avoided.

We have employed cotton in all types of wounds requiring interrupted sutures. Catgut has been substituted only in the infrequent instances in which a continuous suture was found expedient in an effort to conserve time, viz. in peritonealization of the gallbladder bed, in closing of the pleural flaps over the pulmonary stump after a pneumonectomy or in the mucosal suture in an intestinal anastomosis. As indicated later, we have been particularly pleased with the results obtained in contaminated and infected wounds sutured with cotton. Ordinary spool cotton (six cord), which can be bought over the dry goods counter, has proved entirely satisfactory. Sizes 80 and 50 are of suitable caliber for ligation of small vessels. Quilting cotton is used for the ligation of larger vessels and for the suture of peritoneum, fascia and skin. Occasionally it is expedient to employ heavy (no. 5, 10 or 20) mercerized crochet cotton for the ligation of large vessels, such as the pulmonary artery and veins.

The handling of nonabsorbable sutures, whether silk or cotton, is at first difficult for surgeons trained with catgut. However, the original awkwardness is usually overcome after a month's consistent use of cotton, and the results obtained well justify the effort.

CLINICAL STUDIES

Because of the convincing results obtained by Meade and Oschner in their experimental study of suture materials, cotton was adopted as the suture material

From the Department of Surgery Tulane University of Louisiana School of Medicine

Read before the Section on Surgery General and Abdominal at the Ninety Second Annual Session of the American Medical Association Cleveland, June 5, 1941

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8. Gage, Mims. Personal communication to the authors

9. Guerry, Le Grand. Personal communication to the authors

10. Meade, W. H. and Oschner, Alton. Spool Cotton as a Suture Material, J. A. M. A. 113: 2230 (Dec. 16) 1939; The Relative Value of Catgut, Silk, Linen and Cotton as Suture Materials, Surgery 7: 485 (April) 1940

of choice by most surgeons of the Tulane University surgical service at the Charity Hospital. Since its adoption late in 1939, it has been employed in approximately 1,800 operations in this institution. In addition to its use at Charity Hospital, it has been used routinely on

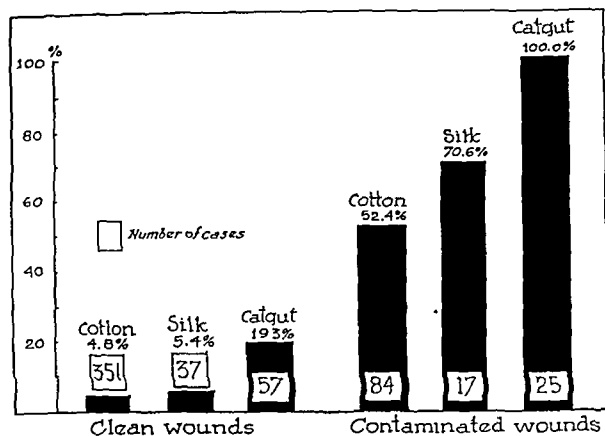


Fig. 1.—Percentage of complicated wounds in relation to type of suture material employed.

private patients by a number of senior members of the staff. The results obtained have appeared satisfactory to all the surgeons using cotton, even though most of those on the Tulane staff were trained in the use of catgut and later became convinced of the efficiency of silk. Since, in the absence of definite statistical data, impressions are known to be misleading, a factual study of wound healing was initiated on Dec. 1, 1940 under the direction of Dr. Alfred B. Longacre, director of the surgical bacteriologic research laboratories of the department of surgery of Tulane University. The figures incorporated in this report are used with his permission and will be published later in more complete detail.

METHODS

A tabular form was developed on which each wound could be classified. Spaces were allowed for the patient's name and hospital number and data on the operation, the surgeon and the types of suture material. Each wound was classified postoperatively as clean, contaminated or infected. By definition a clean wound was taken to be one made under surgical sepsis and not involving the opening of the gastrointestinal tract, the biliary tract, the genitourinary tract or infected tissue. In addition the wounds made by cholecystectomy for chronic cholecystitis in which choledochostomy was not performed and by appendectomy in the absence of acute infection were classified as clean wounds. Exceptions, which were classified as contaminated, were wounds requiring skin grafting for closure, wounds in which the skin was not closed, wounds made through a previously infected area and wounds which were grossly contaminated during the operation by a break in technic. Contaminated wounds were defined further as those not classified as clean in which the operative area did not contain gross infection, such as an abscess. Infected wounds were those made in an area showing gross evidence of bacterial invasion. During the postoperative hospital stay of each patient the wound was indicated to heal by first intention or to be complicated. Complications were listed as hematoma, wound necrosis, disruption, stitch abscess, trivial infection and serious infection. These terms were defined as follows: A

hematoma is a sterile collection of whole blood, serum or plasma in or about the operative wound. Wound necrosis is necrosis of skin or subcutaneous tissues not the result of infection. Disruption is the spontaneous separation of any or all of the layers of the wound. A stitch abscess is any inflammatory or suppurative process about a skin suture or clip from which organisms can be cultured. A trivial infection is one which does not necessitate an increase in the expected length of hospitalization and which does not necessarily interfere with wound healing; a serious infection is one which interferes with wound healing or prolongs the period of hospitalization. An attempt was made to perform bacterial studies in every instance in which an infectious process was suspected; specimens for aerobic and anaerobic culture were collected from discharging wounds or by aspiration of collections of fluid. In addition the chart allowed space for information concerning the time of the first dressing, the time a complication was first noted and the condition of the wound on discharge of the patient. The data were collected through the collaboration of two members of the Tulane visiting staff and the four assistant resident surgeons who were in direct charge of the Tulane surgical wards.

RESULTS OF STUDY

From Dec. 1, 1940 to May 1, 1941, 729 operations were performed at Charity Hospital by thirty members of the Tulane surgical staff. Nine of the seventeen members of the visiting staff and all the thirteen residents and interns used cotton sutures routinely. Three visiting surgeons employed silk sutures routinely; five continued to use catgut sutures. Of 465 cases in which operative procedures were performed and cotton sutures were used the wound in 358 could be classified as clean, in 89 as contaminated and in 18 as infected. Silk sutures were employed in 61 cases, in 37 of which the wound was clean, in 21 contaminated and in 3 infected. Catgut sutures were used in 86 cases; the wound was clean in 57, contaminated in 25 and infected

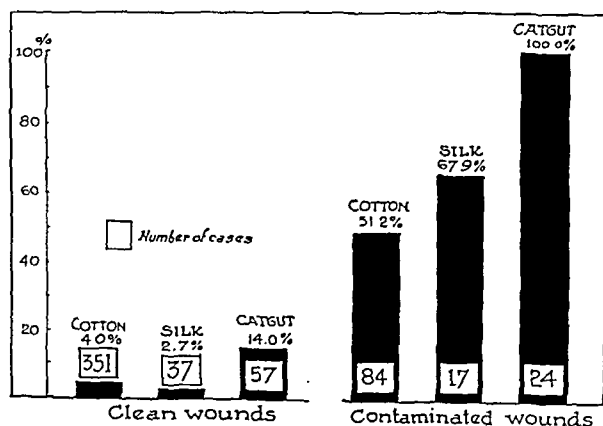


Fig. 2.—Percentage of infected wounds in relation to type of suture material employed.

in 4. Silkworm gut was the sole suture material in 10 instances, and no suture was required in 107 operations.

Of the 57 clean wounds on which catgut sutures were used (figs. 1 and 2), 80.7 per cent healed by first intention, while 19.3 per cent were complicated, 14 per cent by infection. All the contaminated and infected

wounds were complicated. (Twenty-three of the 25 contaminated wounds involved operations in the region of the anal orifice.)

The results with silk were much better. Of the 37 clean wounds sutured with silk, only 5.4 per cent were complicated, 2.7 per cent by infection. However, 70.6



Fig. 3.—Appearance of a patient nine and a half months after subtotal thyroidectomy had been performed. The wound was closed without drainage.

per cent of the contaminated wounds were complicated, 67.9 per cent by infection; all the infected wounds were complicated.

Cotton sutures were employed on 351 clean wounds; of these 4.8 per cent became complicated, 4 per cent by infection (fig. 2). An observation of importance in the evaluation of wounds sutured with cotton was that almost half the contaminated wounds, or 47.6 per cent of 84, healed by first intention. This observation confirms our impression that cotton is better adapted for use in a contaminated or infected field than is any other suture material. As Meade and Ochsner¹⁰ have emphasized, cotton causes a minimal amount of edema and cellular tissue reaction, and use of it leads to a "dry type of healing" not encouraging to the development of infection.

A further consideration of the complications occurring in the clean wounds sutured with cotton will be of interest in that it may demonstrate that there are in every large series of cases certain instances in which infection is unlikely to be avoided. Representative of these are cases in which the closing of skin under tension is followed by a certain amount of necrosis of the skin flaps and cases of amputation of the lower extremity following gangrene due to peripheral vascular disease. In 7 of 14 such cases in our series it was unlikely that infection could have been avoided.

It is gratifying to us that the incidence of complications in clean wounds should be so low in an institution whose patients are drawn from the lowest economic stratum and in which more than half of the operations are performed by the resident staff. It is our belief that this result has been attained largely through the application of an exacting operative technic, an important part of which has been the use of cotton according to Halsted's principles.

The economy with which cotton can be used for sutures has been emphasized by Foss,¹¹ who stated that the annual expense of suture material in his hospital might have been reduced from \$1,500 to \$4.20 by the routine use of cotton. While economy was not a prime objective in our adoption of cotton, nevertheless it was interesting to speculate on the saving which might be made by the practice in a large public institution such as Charity Hospital. Accordingly, a survey was made of the number of operations performed and the type and amount of suture materials used in all services for one month (summarized in the accompanying table).

Cost of Suture Materials

Material	Unit Cost	Amount Used per Operation	Cost per Operation
Cotton.....	\$0.10 per 200 yards	25 yards	\$0.0125
Silk.....	\$0.933 per 25 yards	25 yards	\$0.933
Catgut.....	\$0.1925 per tube	6 tubes	\$1.16

Suture material was employed in 647 operations performed during this period. Cotton was used by members of the Tulane surgical staff in 100 surgical procedures at an average cost of 1¼ cents for the 25 yards (22.8 meters) required in each operation. Silk was employed in 78 operations at an average cost of 93 cents for the 25 yards. An average of six tubes of catgut was used in each of 469 operations, at a cost of \$1.16 per operation. The total cost of suture materials for one month at Charity Hospital was found to be \$618.06. If this month can be taken as representative of the whole year, the cost per annum of suture materials at Charity Hospital can be estimated as \$7,416.72. Use of cotton in the same number of procedures would have cost only \$97.05.

Two pictures of typical postoperative scars are shown in order to demonstrate the type of healing which is obtained with cotton. Figure 3 shows a patient who had undergone subtotal thyroidectomy nine and one-half months previously. The wound was closed without drainage and healed uneventfully. The scar is even less discernible in real life than it is in the photograph. Figure 4 shows the abdomen of a patient thirteen days after ventral herniorrhaphy. Eight years previously there had been an abscess in the same region of the abdominal wall which had been treated surgically. Following a blow on the abdomen eight months before the present admission, a second abscess formed beneath the old scar, and a hernia appeared in the same area. At operation an abscess was found surrounding a piece of silkworm gut 4 cm. in length and lying in contact with the bladder. The abscess was excised, and, despite the presence of infection, a herniorrhaphy was performed. Sulfanil-

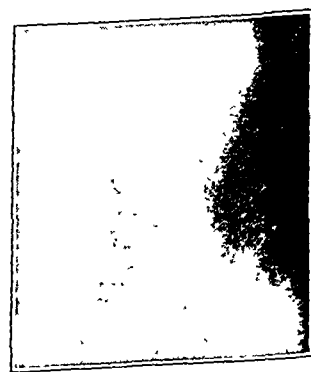


Fig. 4.—Appearance of a patient thirteen days after ventral herniorrhaphy in an infected field.

11. Foss, Harold, in discussion on Estes, W. L., Jr.: End Results in Repair of Inguinal Hernia by a Fascia-to-Fascia Rectus Sheath Closure, Ann. Surg. 113: 838 (May) 1941.

amide was placed in the wound. Healing was by first intention, and there have been no complications in the five months since operation.

SUMMARY

1. In a previously reported experimental study, cotton suture material has been shown to incorporate the qualities of pliability, satisfactory tensile strength, a high coefficient of friction, stability on exposure to heat and moisture and the failure to produce any great tissue reaction.

2. Cotton suture material has been used routinely in the Tulane University surgical service at Charity Hospital for eighteen months, in approximately 1,800 cases.

3. A study of 465 consecutive wounds in which cotton suture material was employed demonstrated cotton to be highly satisfactory in its clinical application.

4. The low cost of cotton, while not of primary importance, is a desirable feature.

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ABSTRACT OF DISCUSSION

DR. DONALD GUTHRIE, Sayre, Pa.: The important things a surgeon should expect of a suture material are, first, that it should be absolutely sterile. Second, it should have the proper tensile strength when placed in the tissues, it should produce the minimal amount of tissue reaction and by its use the need for drainage of wounds should be greatly reduced, because drainage weakens all wounds and exposes them to dangers of infection. Lastly, it should be economical to use. Since Ochsner and Gage suggested the use of cotton thread to replace silk, my associates and I have used this material and are convinced that it is a much better and a safer suture to use. We feel that the knots of cotton are more secure and that it has a better tensile strength. It produces less tissue reaction and our percentage of infections is now even lower than when we employed silk. In keeping careful track of our cases for several years and comparing the results of nonabsorbable with absorbable sutures, we find that our percentage of infection following the use of nonabsorbable sutures has been much lower than that following the use of catgut; also that our percentage of recurrence following herniorrhaphy has been greatly reduced. We have been able further to dispense with drainage in cases of radical mastectomy and in practically all of our operations for thyroidectomy. Another point of advantage in the use of cotton is that patients are not allergic to the cotton—occasionally one is to silk. We agree with the authors that cotton does not produce sinus formation in the presence of infection. In our clinic cotton is used for ligatures and sutures in all herniorrhaphies, all thyroidectomies, all radical and simple mastectomies, about one half of the clean appendectomies and in about two thirds of the clean abdominal wounds. In this way we can keep a careful check of the results of cotton and of catgut. If any surgeon will investigate this question with an open mind and compare his results after the employment of nonabsorbable sutures with those in which catgut is used, he will be convinced that there are many advantages of nonabsorbable suture material over catgut. We feel that Gage and Ochsner have made a contribution to surgical practice in suggesting the use of cotton as a nonabsorbable suture, because, after a thirteen months experience with it we believe it to be a far better suture and ligature material than silk.

DR. JOHN M. FARRIS, Ann Arbor, Mich.: I am glad to report experimental data which tend to corroborate the views of Drs. Meade and Long and Dr. Ochsner. Certain controversies have come from experimental work on suture material because of the difficulty in controlling conditions. The effect of trauma and tension and incomplete hemostasis may often be confused with the presence of a suture itself. To overcome some of these objections, a series of experiments have been

carried out. A piece of silk was placed in the anterior chamber of the rabbit's eye and allowed to remain for fourteen days. During this period it may be observed through the transparent cornea. In general, there is usually but little reaction to the silk, although silk has a tendency to untwist. It is untied at the ends and its diameter has increased twice while it was in the culture medium. A piece of silk in place four weeks showed little difference in the reaction, although it still showed a tendency to untwist. A piece of catgut in three or four days showed a tendency for the strands to undergo dissolution and the aqueous humor to become somewhat opaque. At first we thought the eyes were infected, but cultures in every instance have been negative. In about two weeks the anterior chamber looks more than ever as if it were infected. There is a large amount of exudate about the strands of catgut. The entire anterior chamber becomes completely opaque, and for practical purposes the animal is blind. There is less reaction from the cotton than from any other type of suture material. The cells in the fluid when counted are difficult to find and in a series of 8 animals about 100 cells per cubic millimeter were found, while on the catgut it varied from 2,000 to 600 leukocytes per millimeter, a striking difference in the reaction. A piece of cotton that has been in the eye for four weeks has maintained its small size and its diameter. There is less tendency for it to untwist and fray at the edge. But little reaction occurs in the eye. I have had the opportunity of observing bits of cotton and silk in the eye for a period of a year. These experiments emphasize the view that all sutures are foreign bodies and as such should be used sparingly. A foreign body in some instances on the wound will delay the process of fibroplasia. The suture causes a minimum of foreign body reaction and at that time either disappears from the wound or, if it remains, its sustained presence should not be objectionable. These experiments indicate that cotton fulfils these criteria.

DR. J. E. CANNADAY, Charleston, W. Va.: I am able to corroborate what the authors and the discussers have said with regard to the use of cotton thread sutures in surgery. My associates and I have used cotton thread sutures since the first report made on the subject by Dr. Alton Ochsner in *THE JOURNAL*. Since that time we have used cotton thread sutures in between 500 and 1,000 cases, and we have recently had occasion to check over about 400 of these cases carefully and we found an incidence of infection in clean cases of about 2 per cent. We have used cotton thread sutures for almost every type of surgery and gynecology, in hernias and perineorrhaphies, in gastric and large bowel resections, cholecystojejunostomies and so on, and find that the material is thoroughly satisfactory when used in accordance with the tenets Halsted laid down for silk. We find that cotton thread suture of the finer type, say 50, is a very satisfactory suture for holding fat together. In the fat abdomen we use it. It holds and heals in beautifully. Since we have been using cotton thread sutures routinely we have had one abdominal wound disruption. That was in a resection of the stomach in which chronic bronchitis developed. However, the wound was promptly repaired with cotton thread sutures and satisfactory healing occurred without infection.

DR. ALTON OCHSNER, New Orleans: A word about the preparation of cotton: As Drs. Meade and Long mentioned, cotton contracts when heated and for this reason it should not be sterilized on a rigid spool. Sterilization can be done in one or two ways. When cotton is sterilized on a rubber tube the cotton becomes shortened and the tube compressed. Another way in which it can be done is to wrap cotton around board. This is the technic used in one of the institutions in which I work. Two ties close together are placed around the skein, and the skein is cut between the two ties. It is then placed in a test tube and autoclaved. A word about its use in cases of infection: If I should be told that I could use cotton in only one type of case, I would choose a patient who has a grossly contaminated abdominal wound. It is imperative that interrupted sutures be used. The wound, even though infected, will usually heal with no difficulty and without discharge of the cotton sutures. The incidence of infection is much less in grossly contaminated wounds than when catgut or even silk is used.

SENILE OSTEOPOROSIS OF THE SPINAL COLUMN

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The syndrome of senile osteoporosis as it is understood today is different in some respects from its early description. In the early cases the diagnosis was made on the basis of the clinical findings and was confirmed at necropsy; as a consequence the diagnosis was usually made in the advanced stages and the postmortem examination showed extensive osteoporosis. Today, with improved methods for diagnosis, routine roentgenologic examination may disclose the condition even without clinical signs and symptoms.

Our report is based on a study of 208 patients, 167 women and 41 men. The average age of all when first seen at the Mayo Clinic was 62, the youngest being 45 and the oldest 87. In the cases reported in the literature, somewhat more advanced ages were represented. In 42 selected from various reports the mean age was 66. These figures indicate that senile osteoporosis is definitely associated with the older age groups.

The relation of this syndrome to the female sex is striking and has been an outstanding feature of all comments, the number of women afflicted being about four times the number of men. In general, the life expectancy of women is longer than that of men; thus more women live to the ages at which osteoporosis occurs. Furthermore, women lead a more sedentary life than men, and an atrophy of disuse has been postulated; however, osteoporosis does afflict persons who have always been extremely active. Many of the patients are widowed or single, and this fact might play a part in the development of osteoporosis on the basis of inadequate diet or conditions incidental to living alone.¹ It was found that 42.5 per cent of the women and 19.8 per cent of the men were either single or widowed.

The usual history is that a woman about 59 first notices weakness, fatigue or a dull ache in the lower part of the back. The dull ache gradually becomes worse and may be diffuse all over the back. This early stage usually lasts several years. Then, as the result of a slight jar, a fall, lifting or bending there may be a sudden snap or acute pain in the back. The pain is severe and often compels the patient to go to bed for a few days or weeks. From this time on the dull backache persists; in addition, sharp agonizing pains occur in the back on the slightest movement; turning, jarring or bending is particularly likely to cause them. The pain occurs chiefly in the lower part of the thoracic region and in the lumbar region. Frequently it is projected along the nerve roots, and so a multitude of referred pains occur. These may be in the neck and shoulders, down the arms, along the ribs, over the precordium, in the epigastrium, in both flanks and over the iliac crests, or there may be associated sciatica.

From the Section on Orthopedic Surgery (Drs. Black and Ghormley) and the Section on Roentgenology (Dr. Camp) of the Mayo Clinic.

Abridgement of thesis submitted by Dr. Black to the faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Orthopedic Surgery.

1. Meulengracht, E., and Meyer, A. R.: Osteomalacia of the Spinal Column, *Acta med. Scandinav.* 92: 584-602, 1937.

Their relationship to the condition of the back may be noted because of the aggravation that occurs with movement. Although these pains may be strictly localized to one nerve root, it is rare to find any neurologic signs, such as changes in sensation or reflexes.

The average duration of symptoms was three years, although in several cases symptoms referable to the back had been present for twenty to fifty years. These, however, could not be ascribed to osteoporosis. The occurrence of mild trauma as the primary agent in the onset of acute symptoms has been ascribed to preexisting osteoporosis in which mild trauma has produced collapse of a vertebra and severe pain. The pains, in addition to being made worse by movement, are aggravated by lifting, coughing or sneezing, and in some cases the weather may have some effect. Relief is usually obtained in the recumbent position, although turning over in bed often causes severe pain.

Other symptoms are weakness, easy fatigue and nervousness. The patients frequently have a sensation that the back is likely to give way; this may be interpreted as weakness. Decourt² expressed the opinion that the nervousness and depression observed are part of the syndrome and that frequently they disappear and are replaced by euphoria with successful treatment of the condition. With the progress of the atrophy of bone the patients themselves notice and their friends remark that they are becoming "round shouldered" and are losing stature. The pain in the back and the root pain gradually become worse and finally compel the patient to go to bed for relief. Patients who have died have done so as a result of associated disease.

On physical examination, the patients present all the signs of senility, general atrophy of the tissues and arteriosclerosis. Frequently they are thin and emaciated, although various states of nutrition are seen. In our series the average height of the women was 5 feet 3 inches (160 cm.) and the average weight was 122½ pounds (55.6 Kg.); of the men, 5 feet 7 inches (170 cm.) and 152½ pounds (69.2 Kg.). These figures indicate that the general nutrition was fairly good in the entire group but was better among the men than among the women. The typical appearance in advanced stages is that of a thin little old woman (fig. 1 a, b, c), with loose wrinkled skin and a rounded back, who walks with short, careful steps in order to avoid jarring. The whole body is held tense in walking by protective muscle spasm. The rounded dorsal kyphosis causes the cervical segment of the spinal column to project forward; this is compensated for by an increase in the normal cervical lordosis. Movements of patients without pain or tenderness are free and normal in range; the usual picture, however, is that of marked limitation, due to muscle spasm, of motions of the spinal column. Tenderness on pressure over the spinous processes is not severe or well localized, but bending and jarring bring on severe pains. On the other hand, many patients are remarkably well preserved, well nourished and healthy in every way except for their complaints in regard to the back.

LABORATORY FINDINGS

The urine usually was normal but occasionally showed small amounts of albumin or pus. In 33 cases the blood showed 12.5 Gm. of hemoglobin or less, per hundred cubic centimeters, whereas examination of

2. Decourt, Jacques: A propos des hernies intrasponeuses multiples du disque intervertébral, *Bull. et mém. Soc. méd. d. hôp. de Paris* 50: 857-858 (June) 1934.

blood smears and other hematologic studies established a diagnosis of pernicious anemia in 3 cases and of macrocytic anemia in 4. The flocculation reaction was positive in 10 and doubtful in 3. Gastric analysis was carried out in 29 cases, and there was absence of free hydrochloric acid in 11.

A total of 92 determinations of serum calcium were carried out in 68 cases. The average value was 9.8 mg. of calcium per hundred cubic centimeters; the range was 7.8 to 12.7 mg. The great majority of readings were between 9 and 11 mg. Seventy-seven determinations of inorganic phosphorus in the serum were carried out in 58 cases. The mean value was 3.4 mg. per hundred cubic centimeters, with a variation from 2.1 to 6.5 mg. Similarly, 60 determinations of phosphatase in the serum were carried out in 47 cases. The mean value was 3.8 Bodansky units, with a range from 2 to 13.4 units. In 6 cases in which the values were abnormally high or low, no other cause was found to account for the unusual

disks. The researches of Schmorl and his co-workers on several thousand spinal columns examined at necropsy are outstanding in their demonstration of the normal anatomic and histologic characteristics of the spinal column, as well as of the changes which occur at various ages throughout life under the influences of age, normal activity, trauma and disease. The descriptions that follow have been taken mainly from the writings of Schmorl and his co-workers,³ although other authors have written on the subject.⁴

Senile osteoporosis, involving as it does primarily the trabeculae of spongy bone, is most evident in the vertebrae. Schmorl⁵ has demonstrated the changes in the vertebrae by making preparations in which the marrow tissue and other organic elements have been removed. The cortical bone is much thinner than normal, and there is enlargement of the marrow spaces and the medullary cavity. The surfaces of the trabeculae are clean and smooth and indicate a long, slow, vascular

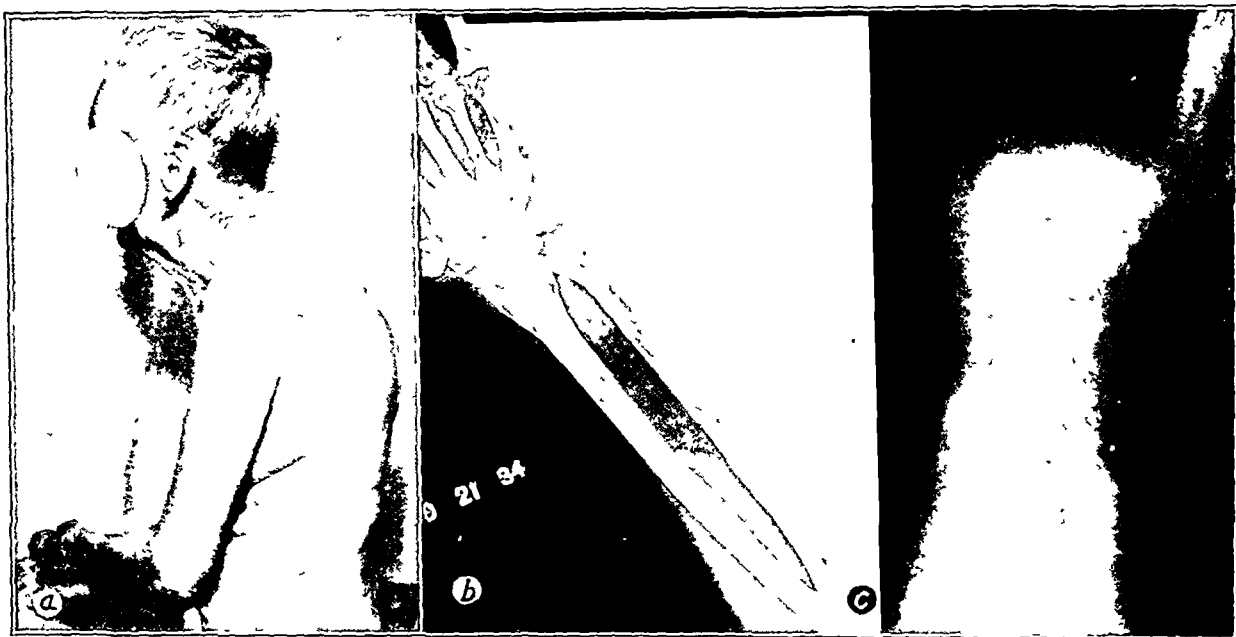


Fig. 1—*a*, Rounded kyphosis of the thoracic segment of the spinal column resulting from senile osteoporosis; *b*, forearm of the same patient revealing moderate osteoporosis; *c*, lumbar segment of the spinal column revealing osteoporosis, expanded intervertebral disks and compressed vertebrae.

values and subsequent determinations gave normal values. In 1 case in which there was an elevated concentration of serum calcium exploration of the parathyroid glands did not reveal a tumor or hyperplasia. In 2 cases of extensive osteoporosis with chemically normal blood constituents exploration was made, and in both cases the parathyroid glands were found to be normal, in agreement with the reports on similar cases by other authors.

The sedimentation rate of the erythrocytes was determined in 31 cases; the average rate was 22 mm. in one hour, with a range from 3 to 58 mm. In some of the cases in which an increased sedimentation rate was noted there was an associated infection; in the others, however, no adequate explanation could be found for the increased rate, although it was not felt to be due to the osteoporosis.

GROSS PATHOLOGIC CHANGES

The changes which occur in the spinal column depend on the degree of atrophy of bone and on the anatomic peculiarities of the vertebrae and the intervertebral

resorption rather than an osteoclastic resorption, in which the surfaces would be rough and irregular. The individual trabeculae are much thinner and fewer than is normal, but their architectural arrangement is maintained.

When osteoporosis has progressed to a certain degree, the bony trabeculae are no longer able to resist the weight of the body and the internal pressure of the intervertebral disks. There occur a collapse of the central portions of the vertebral body and expansion of the nucleus pulposus and disk. The appearance of the narrowed vertebrae has been likened to that of "fish vertebrae" by Schmorl.⁶ This mechanism will not

3 Schmorl, G.: Ueber die an den Wirbelhandscheiben vorkommenden Ausdehnungs- und Zerbrechungsorgänge und die dadurch an ihnen und der Wirbelspongiosa hervorgerufenen Veränderungen, *Verhandl. d. deutsch. path. Gesellsch.* 22:250-262, 1927, footnotes 5, 6 and 19.

4 Joplin, R. J.: The Intervertebral Disc. *Embryology, Anatomy, Physiology and Pathology, Surg., Gynec. & Obst.* 61:591-599 (Nov.) 1935.

5 Schmorl, G.: Zur Technik der Knochenuntersuchung. Bemerkungen zur Diagnose der Ostitis deformans Paget, Ostitis fibrosa v. Recklinghausen und Osteoporose, *Beitr. z. path. Anat. u. z. allg. Path.* 87:585-598, 1931.

6 Schmorl, G.: Die pathologische Anatomie der Wirbelsäule, *Verhandl. d. deutsch. orthop. Gesellsch.* 21:3-39, 1926.

occur if the disks, through degenerative processes, have lost their expansibility. Fissures and cracks in the cartilaginous plates, arising through repeated small injuries incidental to normal activity, may allow the tissue of the nucleus pulposus to work its way out into the substantia spongiosa, giving rise to Schmorl's nodes. The vertebral bodies may collapse in their anterior part, as in a true compression fracture; in this way numerous pathologic fractures occur, either without any or with only minor degrees of trauma.

Degenerative changes in the disks occur usually in the upper thoracic region and lead to thinning of the disks, hypertrophic changes about the anterior margins of the vertebral bodies and dorsal kyphosis. This type of kyphosis is the usual one seen in old persons. The disks in the lower thoracic region and in the lumbar region

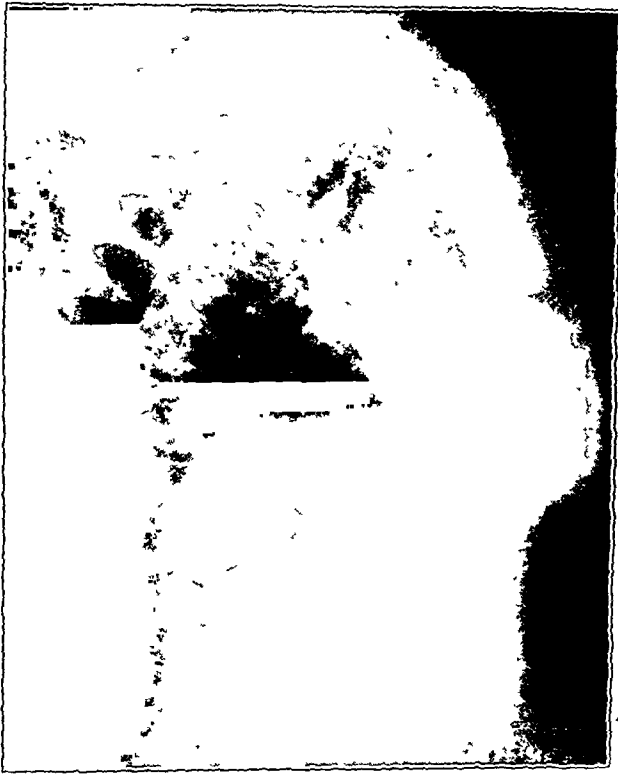


Fig 2.—Extreme osteoporosis of thoracic and lumbar vertebrae with compression fractures and expanded intervertebral disks. This patient was obese.

maintain their expansibility longer than those in the upper thoracic region. They are also normally more expansile, and so the phenomenon of ballooned disks is more often seen in the lower thoracic and the upper lumbar region.

ROENTGENOLOGICALLY APPARENT CHANGES IN SENILE OSTEOPOROSIS

The distribution of the ballooned disks and compressed vertebral bodies in our group was the same as that found by Junghanns.⁷ The intervertebral disks in the lower thoracic and the lumbar region were the ones most frequently involved, and the vertebrae in the same regions were most frequently compressed. In general, the degree of expansion and the number of vertebrae

compressed depend on the grade of osteoporosis. In some patients, all the disks in the thoracic and lumbar regions were ballooned (figs. 2 and 3) and many vertebrae were crushed. In others few such changes were present. Of 18 patients with osteoporosis grade 1 (on a basis of 1 to 4), none had ballooning of the disks; of 47 with osteoporosis grade 2, 34 per cent had ballooning; of 45 with osteoporosis grade 3, 93.3 per cent had ballooning, and of 19 with osteoporosis grade 4, all had extensive ballooning. The incidence of compression of the vertebrae showed a similar variation with the degree of osteoporosis, whereas the presence of hypertrophic changes was common to all groups and showed little relationship to the degree of atrophy of bone.

The cause of the backache and of the sharp radiating pains in osteoporosis has always been a source of discussion. The dull backache has been attributed to osteoporosis per se, and the attribution appears to be justified in many cases because of the association of this type of backache with mild osteoporosis. However, many patients have severe osteoporosis without pain. The sharp pains occur definitely along nerve roots, but they are not due to pressure on the roots, because the foramina are usually free. These pains bear a definite relationship to the site of the ballooned disks and compressed vertebral bodies. The most satisfactory explanation is that the pain is a reflex one that arises from the recently compressed vertebrae and is referred along the nearby nerve roots. Many ballooned disks and compressed vertebrae may be present without related pain.

It has been our impression that in the syndrome of senile osteoporosis of the spinal column, the osteoporosis attains its greatest degree in the bones of the vertebral column. This impression is borne out by the roentgenologic findings in 23 cases in which roentgenograms of the long bones of the upper or the lower extremity, in addition to those of the vertebral column, were available for study.

DIFFERENTIAL DIAGNOSIS

The numerous factors and diseases which lead to atrophy of bone in the spinal column of adults frequently occur in persons in the older age groups and so must be distinguished from senile osteoporosis.

Hyperparathyroidism.—Senile osteoporosis has probably been erroneously diagnosed as hyperparathyroidism more often than as any other condition, and even today an unequivocal roentgenologic diagnosis of senile osteoporosis is difficult to make without first ruling out hyperparathyroidism. The fact that the results of laboratory tests, usually relied on to distinguish between the two, may be within normal limits makes the problem in some cases even more difficult.

Hyperparathyroidism produces a generalized osteoporosis described by Bauer and Camp,⁸ by Camp⁹ and by Camp and Ochsner¹⁰ as a peculiar, miliary mottling and granular appearance of the bone best seen in the flat bones. The roentgenograms of the spinal column may closely resemble those characteristic of senile

⁸ Bauer, Walter, and Camp, J. D.: *Malacic Diseases of Bone*, in Nelson New Loose Leaf Surgery, New York, Thomas Nelson & Sons, 1935, vol. 3, pp. 175n-177a.

⁹ Camp, J. D.: Roentgenologic Changes in Malacic Disease of Bone, *California & West Med.* **41**: 152-157 (Sept.) 1934, Roentgenologic Changes in Malacic Diseases of Bone, *Radiology* **26**: 399-405 (April) 1936.

¹⁰ Camp, J. D., and Ochsner, H. C.: The Osseous Changes in Hyperparathyroidism Associated with Parathyroid Tumor. A Roentgenologic Study, *Radiology* **17**: 63-69 (July) 1931.

⁷ Junghanns, Herbert: An der Adoleszenten, Alters-, und 4: 97-105, 1932, Altersveränder besonderer Berücksichtigung der phos-c, *Arch. f. klin. Chir.* **166**: 106-119, 1931.

osteoporosis, but the characteristic osteoporosis in the skull and flat bones and the subperiosteal decalcification, bowing, fractures and cyst formation in the long bones, in most cases, are easily distinguished from the homogeneous osteoporosis in the flat bones and the slight changes in the long bones seen in cases of senile osteoporosis. When roentgenograms do not give conclusive evidence of hyperparathyroidism, the results of laboratory tests frequently will confirm the diagnosis. The concentration of serum calcium is usually 11 mg. or more per hundred cubic centimeters, and the concentration of inorganic phosphorus in the serum is lowered, whereas the value for serum phosphatase is usually high. The final test is a marked increase in the urinary excretion of calcium and phosphorus. These values are all within normal limits in senile osteoporosis.

Hyperthyroidism.—Roentgenologically, the changes in the spine in some cases of exophthalmic goiter are indistinguishable from those of senile osteoporosis.¹¹ If the patient is less than 40, the question of senile osteoporosis does not arise; with older patients, the diagnosis is made on the basis of the clinical history and findings of exophthalmic goiter. The blood chemistry is normal, the basal metabolic rate is increased and the excretion of calcium is markedly increased, according to studies of the calcium balance. The degree of osteoporosis depends on the length of time that hyperthyroidism has been present and may be out of all proportion to the increase in the basal metabolic rate.¹²

Pituitary Basophilism and Adrenocortical Syndromes.—The syndrome of pituitary basophilism and the adrenocortical syndrome both include a homogeneous, generalized atrophy of bone practically identical with that found in senile osteoporosis.¹³ The age of some patients and the physical characteristics of obesity, hypertension, hirsutism and abdominal striae with changes in the primary and secondary sex characteristics serve to distinguish these conditions from senile osteoporosis. However, there were a number of cases in the group studied in which osteoporosis, hypertension and obesity occurred; the other characteristics of these two syndromes were not noted. Similar observations by others have led to the hypothesis that senile osteoporosis is due to changes in the pituitary gland and in other glands of internal secretion.¹⁴

Metastatic Malignant Lesions.—The question of the presence of an osteoclastic type of metastatic malignant lesion frequently arises in connection with extensive osteoporosis of the spinal column of persons more than 40. The diagnosis is usually made without difficulty, roentgenologically, by the presence in malignant disease of localized regions of destruction, invasion of the pedicles of the vertebrae or regions of destruction in the flat bones. However, the osteoporosis caused by infiltration of malignant tumor cells is often homogeneous in its distribution. The softened vertebral bodies under the effect of the expansile intervertebral disks

become "fish vertebrae," and many pathologic fractures occur.¹⁵ Two factors of great value in the diagnosis of generalized carcinomatosis with or without a known primary lesion are the sedimentation rate and the blood smear. The sedimentation rate of the erythrocytes is rapid and, in the absence of infection or other factors causing such a high rate, is diagnostic of generalized carcinomatosis. The blood smear in cases in which there is extensive metastasis to bone frequently shows immaturity of the myeloid cells, the so-called leukemoid reaction, and in the absence of other factors causing such a change is also diagnostic of metastasis of a malignant tumor to the bone marrow.

Multiple Myeloma.—Multiple myeloma, like metastatic carcinoma and by the same mechanism, may give rise in the vertebral column to osteoporosis, ballooned



Fig. 3—Senile osteoporosis of the lumbar segment of the spinal column with expanded intervertebral disks and compressed vertebrae.

intervertebral disks and collapsed vertebrae identical with the roentgenographic picture of senile osteoporosis. Usually, however, localized evidence of destruction of bone is seen in the ribs, the pelvis and most clearly of all in the skull.⁸ The clinical symptoms are similar to those of senile osteoporosis except that the pain is more severe. It persists even while the patient is recumbent and may require morphine for relief. Secondary renal changes are common and may lead to albuminuria and an increase in the nonprotein nitrogen of the blood.¹⁶ Bence-Jones protein in the urine in some cases of multiple myeloma clearly distinguishes the condition from senile osteoporosis, in which Bence-Jones proteinuria is absent. Sternal puncture will reveal the presence of myeloma cells in a high percentage of cases.

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13. Cushing, H. J.: Dyspituitarism, *Arch. Int. Med.* 51: 487-557 (April) 1933. Wilder, R. M.: Symposium Polyglandular Dyscrasias Involving Abnormalities of Sexual Characteristics, *Proc. Staff Meet., Mayo Clin.* 8: 97-110 (Feb 15) 1933. Cushing²¹

14. Bergheim, Olaf: The Absorption of Calcium and Phosphorus in the Small and Large Intestines, *J. Biol. Chem.* 70: 51-58 (Sept) 1926.

15. Ghormley, R. K.; Sutherland, C. G., and Pollock, G. A.: Pathologic Fractures, *J. A. M. A.* 109: 2111-2115 (Dec. 25) 1937.

16. Geschickter, C. F., and Copeland, M. M.: Tumors of the Bone (Including the Jaws and Joints), revised ed., New York, American Journal of Cancer, 1936, pp. 441-488.

Chronic Infectious Arthritis.—Extensive osteoporosis is frequently seen in the spinal column and around the involved joints in cases of chronic infectious arthritis. It is difficult to say whether this atrophy of the bone is produced by the infectious process itself or whether it is the result of the disuse and inactivity so commonly an accompaniment of this disease. In excluding cases of chronic infectious arthritis from the group of cases of senile osteoporosis, certain criteria were used. The history of a prolonged course of pains, stiffness, redness and swelling of other joints, particularly if the disease came on before the age of 40, with anemia, an increased sedimentation rate, atrophy and destructive changes in other joints, was taken as sufficient evidence of chronic infectious arthritis.

Spondylitis Deformans.—In cases of early spondylitis deformans there is mild to moderate osteoporosis without the extensive ankylosis of all the vertebrae that is so evident in the late stages of the disease. This condition usually occurs in younger persons; they complain of stiffness and pain in the back which persists on lying down and is worse in cold damp weather. Examination reveals much limitation of motion in the spinal column and in expansion of the thorax. Roentgenographically, destructive changes in the sacroiliac joints and intervertebral facets, with beginning calcification of the spinal ligaments, indicate the presence of spondylitis deformans. Examination of the blood frequently reveals evidence of secondary anemia and an increased sedimentation rate. In senile osteoporosis there is not the destruction of these joints or the calcification of ligaments that is seen in spondylitis deformans, nor is there an increased sedimentation rate.

Osteomalacia.—It is now known that the essential factor in the production of osteomalacia is a failure of the intake¹⁷ of calcium, phosphorus and vitamin D to satisfy the bodily requirements for these substances. It is the adult equivalent of the rickets of children. Osteomalacia associated with pregnancy and lactation is rarely seen in most countries, but it is still endemic in China and certain parts of India. Osteomalacia may occur with various nutritional deficiencies, such as idiopathic steatorrhea, sprue,¹⁸ celiac disease and other conditions.¹⁹ The concentration of calcium in the blood is high, as in rickets.

Roentgenologically the changes in the spinal column may be the same in both osteomalacia and senile osteoporosis, but usually there is marked distortion of the bony pelvis, and the long bones are involved to a greater extent in osteomalacia than is ordinary in senile osteoporosis. In addition osteomalacia is characterized by symmetrical areas of decalcification or pseudofractures of the long bones, the so-called Looser zones. It may be impossible to distinguish mild osteomalacia from senile osteoporosis unless the age of the patient is such as to exclude the latter.

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Bennett, T. L.; Hunter, Donald, and Vaughan, Janet M.: *Idiopathic Steatorrhea (Ge's Disease). A Nutritional Disturbance Associated with Steatorrhea and Anemia*, Quart. J. Med. **1**: 603-678 (Oct.) 1932.
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ETIOLOGY

It has been generally accepted in the past that osteoporosis is a natural accompaniment of advancing age. However, when one observes a large number of elderly persons, it is readily apparent that only a small proportion suffer from a severe lack of calcium in their bones. One is therefore led to believe that senile osteoporosis is a pathologic process. Many hypotheses have been proposed to explain its onset, the more important of which may be listed as follows: dietary deficiency, gastric achlorhydria, endocrine imbalance and inactivity.

It is certain that in not all cases of osteoporosis is there deficiency in the calcium intake, and so other hypotheses have been put forward. The place that gastric acidity plays in the absorption of calcium has been stressed recently. It is reasonable to suppose that achlorhydria when present may play a part in the production of osteoporosis by interfering with the absorption of calcium. However, it can be only a minor part, for Schmidt and Greenberg²⁰ have shown that normal assimilation of calcium does occur in the absence of hydrochloric acid in the stomach. In the present study, gastric analysis was carried out in 29 cases. In 18 the contents of the stomach showed normal values for hydrochloric acid, and in 11 free hydrochloric acid was absent. These results would indicate that achlorhydria may be a factor in the production of osteoporosis in some cases but that in the majority of cases other factors are responsible.

It has been pointed out that in pituitary basophilism²¹ there is extensive osteoporosis. Rutishauser and Maubetsch²² in 1934 proposed the hypothesis that in old age there is a proliferation of the basophilic cells and therefore a relative preponderance of these cells in the pituitary gland and that the secretion derived from them causes osteoporosis. There has been little confirmatory evidence for the theory. There have been various attempts to show that senile osteoporosis is the result of parathyroid hyperplasia. However, these probably involved errors in diagnosis, since the preponderance of evidence seems to indicate that in senile osteoporosis the parathyroid glands are normal. In the present series, the parathyroid glands were explored in 3 cases and in all 3 were entirely normal.

Associated with the osteoporosis in our cases were a group of diseases, many of which, for example, arteriosclerosis, coronary sclerosis and cardiac failure, were associated with old age and had no bearing on the occurrence of atrophy of bone. Others, such as hypertension, cholecystitis and asthma, were regarded as incidental. There was a small group of diseases which did perhaps play some secondary part in the production of osteoporosis. In 3 cases of pernicious anemia, malnutrition and achlorhydria may have affected the absorption of calcium. In 8 cases of diabetes mellitus, acidosis or dietary regulation may have interfered with the calcium metabolism. Golden and Abbott²³ and others have noted the association of diabetes mellitus with osteoporosis. In 1 case of duodenal ulcer and in 1 of Addison's disease, the diet and malnutrition may have played parts in the causation of the osteoporosis.

20. Schmidt, C. L. A., and Greenberg, D. M.: *Occurrence, Transport and Regulation of Calcium, Magnesium and Phosphorus in the Animal Organism*, Physiol. Rev. **15**: 297-434 (July) 1935.
21. Cushing, Harvey: *Further Notes on Pituitary Basophilism*, J. A. M. A. **99**: 281-284 (July 23) 1932.
22. Rutishauser, E., and Maubetsch, Annie: *Der Calcium-Phosphor-gehalt des Skeletts und des Blutes bei einfacher, seniler Osteoporose*, Beitr. z. path. Anat. u. z. allg. Path. **94**: 332-344, 1934.
23. Golden, Ross, and Abbott, Hodson: *The Relation of the Thyroid, the Adrenals and the Islands of Langerhans to Malacic Diseases of the Bone*, Am. J. Roentgenol. **30**: 641-648 (Nov.) 1933.

In 33 cases there was moderate secondary anemia. The anemia is suggestive of general poor health which might have been an etiologic factor in the osteoporosis.

TREATMENT

The object of therapy in cases of senile osteoporosis is threefold: first, to relieve the severe pain; second, to prevent further deformity, and third, to promote

TABLE 1.—Results of Treatment in Senile Osteoporosis

Type of Treatment	Result							
	Group 1*		Group 2		Group 3		Group 4	
	No.	%	No.	%	No.	%	No.	%
Calcium, phosphorus, vitamin D, physical therapy and support to back.....	10	22.2	16	35.6	16	35.6	3	6.7
The same without vitamin D.....	0	0	0	0	3	75.0	1	25.0
The same without calcium or phosphorus.....	2	25.0	3	37.5	3	37.5	0	0
Subtotal.....	12	21.1	19	33.3	22	38.6	4	7.0
Physical therapy and support to back without calcium, phosphorus or vitamin D.....	1	6.6	4	26.7	7	46.7	3	20.0
Total.....	13	81.1	23	31.9	29	40.3	7	9.7

* Group 1 "cured" or "very much better"; group 2 "much better" or "better"; group 3 "the same" or "a little better"; group 4 "worse."

recalcification of bone. Relief of pain is best obtained when the patient is recumbent. Too prolonged rest in bed should be avoided, since inactivity tends to cause increased atrophy of bone and it is difficult to get patients up and about again. In addition, the application of heat and massage to the spine does much to relieve pain and muscle spasm.

The problem of preventing further loss of calcium from the bones is one of diet and nutrition. The first consideration in the diet is that the carbohydrate, fat and protein constituents be adequate, for many old persons are undernourished and anemic, and their dietary habits are often faulty. Good general health aids in the normal absorption and utilization of calcium,²⁴ phosphorus and vitamin D. The diet should include milk, cheese, eggs and other foods high in calcium and phosphorus in order to supply these elements in the forms in which they are most easily absorbed.²⁵

In practice, the diet is supplemented by salts of calcium and phosphorus and concentrates of vitamin D. Calcium salts may be given orally, intravenously or intramuscularly. Calcium is utilized better when parenterally administered than when taken orally; however, parenteral administration is disagreeable to the patient and is impractical, especially when treatment extends over months and years, because the end results are the same as for oral administration. Different authors have used various salts, such as calcium chloride, calcium lactate, calcium gluconate, calcium chlorate and calcium glycerophosphate, with equally favorable results for various conditions requiring calcium therapy. In order to supply both calcium and phosphorus, various phos-

phate salts of calcium have been used.²⁶ These are relatively insoluble, but in the presence of adequate amounts of vitamin D they are readily absorbed.²⁷ Tri-basic calcium phosphate has been most commonly used at the Mayo Clinic because it contains more calcium and phosphorus per gram than the other salts. Although the daily requirement of calcium is about 0.5 to 1 Gm. in actual treatment an excess is given to insure adequate absorption.²⁸ The dose for tribasic calcium phosphate is 1 teaspoon three times a day. It has been pointed out that vitamin D is essential for the absorption and utilization of calcium and phosphorus. The daily dose recommended is 625 units²⁸ for normal adults; 10,000 to 50,000 units may be used in the treatment of vitamin D deficiency states.

The consensus in regard to the efficacy of treatment of senile osteoporosis seems to be one of confirmed pessimism; however, most reports have shown favorable progress of patients treated with calcium and vitamin D. The results of treatment in our group have been studied to determine how beneficial the therapy was. Many patients could not be traced, others had died and for those who did reply it was sometimes difficult to evaluate the effects of the separate therapeutic procedures advised. Follow-up reports were received on 83 cases, in 11 of which death had occurred and there was no information available relating to the condition of the spinal column. In the remaining 72 the average time elapsed since the initial examination and treatment was two and three-tenths years; the longest time was nine years. In order to compare the effect of the various therapeutic measures (table 1) the patients were divided into four groups: (1) "cured" or "very much better," (2) "much better" or "better," (3) "the same" or "a little better" and (4) "worse." The symptoms of 50 per cent of the 72 patients were definitely improved. When we compare the patients treated with calcium and phosphorus, with vitamin D or with all three drugs with those who did not receive these essentials we find that 54 per cent of the former and only 33 per cent of the latter were benefited by the treatment.

TABLE 2.—Relation of Duration of Treatment to Results for Patients to Whom Calcium, Phosphorus and Vitamin D Were Given

Duration of Treatment	Result				Total
	Group 1*	Group 2	Group 3	Group 4	
Six months and less.....	1	2	2	2	7
Six months to a year.....	4	5	3	0	12
One to two years.....	1	4	3	0	8
More than two years.....	4	5	3	1	13
Unknown.....	..	..	5	..	5
Total.....	10	16	16	3	45

* Group 1 "cured" or "very much better"; group 2, "much better" or "better"; group 3 "the same" or "a little better"; group 4 "worse."

When results are considered with respect to the length of time the treatment was carried out (table 2), only the group of cases in which calcium, phosphorus and vitamin D were given can be studied. In the other groups, there were many cases in which the length of time that the treatment had been given could not be

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26. Higgins, G. M., and Sheard, C.: Secondary Calcium Phosphate Versus Tertiary Calcium Phosphate in the Nutrition of Growing Chicks, *Proc. Staff Meet., Mayo Clin.* 8: 249-252 (April 26) 1933.

27. Adams, Mildred; Boothby, W. M., and Snell, A. M.: Metabolic Studies in Osteoporosis, *Am. J. Physiol.* 114: 383-398 (Jan.) 1936.

28. Dosage of Preparations Containing Vitamins A and D, Report of the Council on Pharmacy and Chemistry, *J. A. M. A.* 109: 507 (Aug. 14) 1937.

determined, and the remaining cases were too few for comparison. The symptoms of only 43 per cent of the patients treated for less than six months were improved. On the other hand, the symptoms of 70 per cent of the patients treated for six months or longer were improved.

With regard to the roentgenographic evidence of improvement, there were 18 cases in which follow-up roentgenograms were available. The roentgenograms were taken on an average of twenty-nine months after the beginning of treatment. In no case was there a sufficient change to enable one to say that it was due to recalcification and not to variation in the technic used in taking the roentgenogram.

CHANCROID

TREATMENT WITH SULFATHIAZOLE AND SULFANILAMIDE

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This report deals with 175 patients with chancroid, 150 treated with sulfanilamide and 25 with sulfathiazole. There were 167 men and 8 women, 127 Negroes, 44 white persons, 3 Puerto Ricans and 1 Chinese. The average age was 30.2 years, the youngest patient being 18 and the oldest 58. The majority of the lesions were on the external genitalia (fig. 1). Two patients had ulcerations on the pubis, and 2 had them around the anus. Forty-eight had multiple lesions. The average duration of the lesions was thirty-one days. There were two of five days' and one of three years' duration.

DIAGNOSIS

The diagnosis of uncomplicated chancroid was based on the identification of *Hemophilus ducreyi* on smear from a characteristic ulcerative lesion and a positive reaction to Ducrey vaccine given intradermally. In addition, absence of *Treponema pallidum* on dark field examination and negative Wassermann and Frei reactions were required.

The most reliable single factor in the precise diagnosis of chancroid is the identification of the Ducrey bacillus, discovered by Augusto Ducrey of Rome in 1892 (fig. 2). The failure to demonstrate Ducrey bacilli on smear does not necessarily rule out this disease. Lesions which are contaminated or treated with caustics, or of long duration, with sloughing areas, or multiple infections often yield poor smears in which it is difficult to identify the organism. After thorough cleansing of such lesions with saline solution for two days repetition of the smear is more likely to reveal it. Among the 175 cases reported here the Ducrey organism, stained by the Unna-Pappenheim method, was demonstrable in 155 (88.5 per cent) and not found in 20 (11.5 per cent). In the 20 cases the reaction to the intradermal injection of Ducrey vaccine was positive.

REACTION TO INTRADERMAL INJECTION OF DUCREY VACCINE

The reaction following the intradermal injection of 0.1 cc. of Ducrey vaccine is specific.¹ At the end of

forty-eight hours, a papule 10 mm. in diameter, surrounded by a zone of erythema 5 mm. wide, denotes a positive reaction. A negative reaction leaves little to be seen at the site of inoculation (fig. 3). The test was introduced by Ito in 1913 and later by Reenstierna. In 1923 Nicolle and Durand in France introduced a commercial product known as dmelcos vaccine. Both these vaccines employ killed Ducrey organisms. A suitable tested domestic vaccine is now available commercially. The reaction becomes positive for the first time between eight and fifteen days after the appearance of the local lesion.² A negative reaction after this time rules out a chancroidal infection in about 95 per cent of cases.³ A positive reaction may mean that the patient has a chancroidal lesion at the time the test is performed or that he has had a chancroidal lesion at one time. The reaction probably remains positive throughout the patient's life. We have observed no reversal of the intradermal reaction after successful therapy.

Table 1 indicates that in cases of proved chancroid there were only 5.4 per cent of negative reactions. In the cases of other diseases listed, in which there was no clinical evidence of or smear positive for chancroid, the large number of positive reactions to intradermal injections of vaccine likely indicates past chancroidal infections.⁴

CLINICAL CHARACTERISTICS

In all cases there were definite ulcerations suggestive of chancroid. Inguinal adenitis was present in 73 (42 per cent); in 55 (75 per cent) it subsided without suppuration, and in 18 (25 per cent) the abscess broke down. In 8 of the 18 cases of definite inguinal abscess there was draining of the inguinal sinuses due to spontaneous rupture of the abscesses. There were 55 cases (75 per cent) of unilateral and 18 (25 per cent) of bilateral adenopathy.

The chancroidal bubo consists of inguinal nodes which are acutely inflamed and matted together and are extremely tender. The bubo is associated with systemic manifestations, such as fever, malaise and leukocytosis. The purulent material aspirated from broken down abscesses is thick and has a characteristic brick red color. In many cases the pus aspirated will not show organisms on smear or culture, although a potent antigen



Fig. 1.—Chancroidal ulceration of the prepuce throughout the entire circumference, with the consequent production of paraphimosis.

for the Ducrey intradermal test may be prepared in a manner similar to that used for the Frei antigen. In some cases, however, Ducrey bacilli may be cultured from the inguinal abscess.⁵

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- Sanderson, E. S.: The Laboratory Aspects of Chancroid and Lymphogranuloma Venereum, *Am. J. Pub. Health* 30: 623, 1940.

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1. Cole, H. N., and Levin, E. A.: The Intradermal Reaction for Chancroids with Bubo Pus, *J. A. M. A.* 105: 2040 (Dec. 21) 1935.

METHOD OF TREATMENT AND RESULTS

The earliest reports of successful therapy of chancroid with sulfanilamide appeared in the United States and in England almost simultaneously in March,⁶ April⁷ and May⁸ 1938. Since then confirmatory reports have come from many sources here and abroad.⁹



Fig. 2.—Ducrey organisms. Note the parallel “school of fish-like” arrangement of the organisms as they are seen on direct smear from chancroidal lesions.

All our patients were ambulatory and were seen in a clinic. Of the 175 treated, 150 received sulfanilamide orally, 1.2 Gm. (20 grains) four times a day for the first five days, followed by 0.6 Gm. (10 grains) four times a day for the next nine days, a total of 45.6 Gm.

TABLE 1.—An Evaluation of the Intradermal Reaction to Ducrey Vaccine*

Clinical Diagnosis	Number of Cases	Positive Reactions		Negative Reactions	
		Number	Percentage	Number	Percentage
Chancroid					
With adenitis.....	33	33	94.6	0	5.4
Without adenitis.....	60	55		5	
Control cases					
No history or clinical evidence of chancroid or adenitis (Saunders and his associates ¹⁰)...	117	3	2.6	114	97.4
Other diseases tested					
Lymphogranuloma venereum with adenitis and positive Frei reaction.....	39	15	38	24	62
Granuloma inguinale....	22	11	50	11	50
Syphilitic chancre.....	3	1	33.3	2	66.7

* The Ducrey vaccine was supplied by the Lederle Laboratories, Inc.

(700 grains) in fourteen days.¹⁰ The remaining 25 patients received sulfathiazole orally, 0.5 Gm. (7.5 grains) four times a day for ten days. Thus a total of 20 Gm. (300 grains) was used.¹¹ At the end of the stated period administration of each drug was stopped whether or not the lesion had healed.

Mild toxic phenomena, such as occasional nausea, dizziness and cyanosis, were present in the sulfanil-

amide-treated group. Two patients in the sulfathiazole group had conjunctivitis and 1 erythema nodosum during therapy. The two groups were singularly free of any major toxic reactions. There was no anuria or hematuria.

Local application of powdered sulfanilamide or sulfathiazole proved efficacious for superficial lesions.¹² For deeper ulcerations of long duration oral therapy was needed in addition to produce healing.¹³ There is no contraindication to the simultaneous use of local and systemic chemotherapy. The results of therapy were uniformly successful with the two drugs. All lesions healed within an average of fourteen days. In this series we did not find any lesions resistant to the form of therapy employed (figs. 4, 5 and 6).

SURGICAL ASPECTS OF CHANCROID

Before the advent of chemotherapy surgical intervention in cases of chancroid included incision and drainage of fluctuant buboes, the “dorsal slit” of the prepuce, cauterization of open lesions and circumcision. Since the introduction of sulfanilamide and its derivatives, radical elective surgical procedures have been eliminated. In all the cases of inguinal adenopathy, with or without abscess formation, there was no necessity for incision. Aspiration was found sufficient when necessary. As a general rule, any incision of the prepuce in the presence of an active chancroidal lesion will result in the implantation of the Ducrey organism in the incision. Thus a spread of the local infection by unavoidable autoinoculation is produced and defeats the purpose for which the incision was originally performed.

In a series of 247 cases of circumcision for chancroid reported from Cleveland,¹⁴ “autoinoculation along the line of incision was almost invariably encountered but was not troublesome when local treatment was instituted with various antiseptic solutions over a period of twenty-eight days in a hospital.” Circumcision of a patient who has active chancroidal disease on the



Fig. 3.—Intradermal reaction to Ducrey vaccine forty-eight hours after the test was performed. Note the vesiculation of the central nodule and the peripheral erythema.

genitals, even with paraphimosis, has not been found advisable or necessary in any of the cases here reported. The edema and infection subsided with oral chemotherapy.

6. Kornblith, B. A., and Chargin, L.: Chancroid, Cured with Sulfanilamide: Lymphogranuloma Venereum; Syphilis, Arch. Dermat. & Syph. 38: 476 (Sept.) 1938.
7. Hanschell, H. M.: Sulfanilamide in the Treatment of Chancroid, Lancet 1: 886, 1938.
8. Hutchison, A.: Treatment of Chancroidal Bubo with Sulfanilamide, Lancet 1: 1047, 1938. Barchelor, R. C. L., and Lees, R.: Treatment of Chancroid with Sulfanilamide, Brit. M. J. 1: 1100, 1938.
9. Kornblith, B. A.; Jacoby, A., and Vishengrad, M.: Treatment of Chancroid with Sulfanilamide, J. A. M. A. 111: 523 (Aug. 6) 1938; Sulfanilamide in Treatment of Chancroid, New York State J. Med. 39: 364, 1939. Culp, O. S.: Treatment of Chancroid with Sulfanilamide, Am. J. Syph., Gonorr. & Ven. Dis. 24: 622, 1940.
10. Sulfanilamide was supplied by the Winthrop Chemical Co., Inc.
11. Sulfathiazole was supplied by Lederle Laboratories, Inc.

12. Lepinay: The Local Application of Sulfanilamide or Its Derivatives in Powder Form for Chancroid, Bull. Soc. franç. de dermat. et syph. 45: 1728, 1938.
13. Fields, R. S., and Weinstein, S. S.: The Use of Sulfanilamide Powder Locally in the Treatment of Chancroid, Urol. & Cutan. Rev. 42: 880, 1938.
14. Rauschkolb, J. E.: Circumcision in the Treatment of Chancroidal Lesions of the Male Genitalia, Arch. Dermat. & Syph. 39: 319 (Feb.) 1939.

Circumcision after cure of a chancroidal infection should be deferred for at least two or three months after all signs of local infection have completely subsided. The risk of poor healing or reactivation of sluggish organisms in the depths of the tissues if operation is performed earlier is always present.



Fig. 4.—Multiple chancroidal ulcerations in the pubic region; duration four weeks.

Biopsy of genital lesions for diagnosis has been advocated.¹⁵ The histologic differentiation of chancroid from lesions which may simulate it, i. e., lymphogranuloma venereum, granuloma inguinale and syphilis, is difficult. The lesions are all granulomas and depend on the isolation of the individual causative organism for their specific identification. We find that biopsies are essential and of value when bacteriologic methods have failed or when a lesion fails to respond to specific therapy. Whenever the possibility of carcinoma arises biopsy is definitely indicated. In one year, 2 squamous cell carcinomas, 1 of the penis and 1 of the anus, and 2 adenocarcinomas of the rectum were discovered by biopsy. Indiscriminate biopsies, however, are not advisable.

REINFECTION OR RELAPSE

Among 50 patients whose course was followed for two months to three years, 6 had subsequent ulcerations in which Ducrey bacilli were demonstrated. The intervals between the appearance of the successive lesions were in case 1 three weeks, in case 2 seven months, in case 3 four months, in case 4 two and one-half months, in case 5 ten months and in case 6 two years. The subsequent lesions occurred at a site different from the original one in all but case 2. A brief description of cases 1 and 2 follows:

CASE 1—A Negro youth aged 20, first seen April 29, 1938, was treated successfully with sulfanilamide for two chancroidal lesions on the corona penis. The lesions healed completely in ten days. He returned three weeks later, with a fresh ulceration on the frenulum, admitting unprotected coitus in the interval. This lesion, which showed Ducrey bacilli, likewise healed promptly when sulfanilamide was given orally. The patient has remained well for twenty months.

CASE 2—A Negro aged 30, first seen March 17, 1939, was successfully treated with sulfanilamide for four ulcerations on the prepuce and bilateral inguinal adenitis of two weeks' duration. The lesions healed in fourteen days. On Oct. 2, 1939, seven months after the original lesions had healed, he

returned with a fresh group of five ulcerations on the prepuce, with bilateral suppurative inguinal adenitis of three weeks' duration. The new lesions responded to oral sulfanilamide therapy, which produced healing in sixteen days. The inguinal abscess was absorbed.

In all 6 cases a definite history of repeated unprotected coitus was obtained. In case 1, in which the interval between the appearance of fresh lesions was only three weeks, the possibility of relapse must be considered. The lesion, however, was at a new site, and since it healed the patient has had no further recurrence. In every case the subsequent lesions responded to a second course of therapy and have remained healed. The weight of evidence would seem to indi-

TABLE 2.—Cases of Chancroid Associated with Other Venereal Diseases

Disease	Total	Cases of One Two, Three and Four Diseases	
			%
Chancroid	175	81	46
Chancroid and syphilis.....	52	67	39
Chancroid and gonorrhea.....	8		
Chancroid and lymphogranuloma venereum	6		
Chancroid and granuloma inguinale.....	1		
Chancroid, gonorrhea and lymphogranuloma venereum	2	20	11
Chancroid, syphilis and gonorrhea.....	8		
Chancroid, syphilis and lymphogranuloma venereum	10		
Chancroid, syphilis, gonorrhea and lymphogranuloma venereum	4	7	4
Chancroid, syphilis, gonorrhea and granuloma inguinale	1		
Chancroid, syphilis, lymphogranuloma venereum and granuloma inguinale.....	2		
Total.....	175	175	100

cate that reinfection rather than relapse occurred in all the cases mentioned. There were, however, 2 cases of definite relapse in which sulfathiazole powder applied locally had been used alone and in which the response to oral medication with sulfathiazole was prompt.



Fig. 5.—The same lesion as in figure 4, five days after sulfanilamide therapy.

ASSOCIATED LESIONS

The presence of more than one venereal disease is not the exception but rather a frequent occurrence. Among 175 patients less than half (46 per cent) appeared with one disease; the remaining 54 per cent had two, three or four venereal infections simultaneously or in quick succession. Among the patients with chancroid associated with syphilis 3 had a primary

15. Fund, E. R.; Greenblatt, R. B., and Hull, G. B.: Histologic Differentiation of Venereal Granuloma, Lymphogranuloma and Chancroid, *Am. J. Syph., Gonorr. & Ven. Dis.* 22: 495, 1938.

syphilitic chancre. The association is uncommon because of the difference in the incubation periods of the two diseases. A brief description of 3 cases follows:

CASE 1.—A Negro aged 22 had two ulcerations on the prepuce which had not healed for two months. He was found to have two separate ulcerations, one on the frenulum and another on the dorsum of the glans penis. The Wassermann test, dark field examination and Frei test all gave negative results. Sulfanilamide was given orally, and the ulceration on the frenulum healed over within five days. The lesion on the dorsum of the glans penis, however, became more indurated. Another dark field examination revealed *T. pallidum*.

CASE 2.—A Negro aged 39 was seen on Jan. 19, 1938, with a definite syphilitic chancre; dark field examination gave positive results. He was given six injections of neoarsphenamine, and the chancre healed over within two weeks. However, three more ulcerations on the corona penis, which were also present, began to get larger. These proved to be chancroidal ulcers, which healed promptly with sulfanilamide therapy.



Fig. 6.—The same lesion as in figure 4; there is complete healing fourteen days after sulfanilamide therapy.

CASE 3.—A white man aged 25 was admitted with two dime-sized ulcerations on the frenulum and corona penis of one week's duration. The Wassermann reaction was negative; dark field examination gave negative results; smears for Ducrey organisms were positive. Both ulcerations healed promptly with sulfanilamide therapy in fourteen days. The patient returned two weeks after healing took place with a fresh ulceration on the frenulum, the site of one of his previous ulcerations. Dark field examination of this lesion revealed *T. pallidum*. It is most likely that a simultaneous infection took place in this case, since the chancroid appeared within one week and the syphilitic chancre two weeks after the chancroid had healed.

These 3 cases illustrate that while sulfanilamide and its derivatives have no effect on syphilitic lesions, anti-syphilitic therapy has no beneficial effect on concomitant chancroidal lesions.

In the treatment of the patient with multiple infections, the simultaneous administration of the arsphenamines, bismuth compounds, tartar emetic and Frei antigen has not produced any untoward toxic effects. Thus combined lesions may be treated at the same time. The known precautions of blood counts, examination of the urine and clinical observations of the patient should certainly be carried out.

Nine patients for whose lesions a definite diagnosis was not possible were given sulfanilamide or a derivative. When no healing of the lesion took place, it was found on further investigation not to be a chancroid.

From the foregoing data it would seem that the use of sulfanilamide and its derivatives is indicated as a therapeutic test. If the lesion fails to heal, other diagnostic means and other therapy should be tried.

SUMMARY AND CONCLUSIONS

1. A series of 175 consecutive ambulatory patients with chancroid infection were treated with sulfanilamide and sulfathiazole.

2. The identification of the Ducrey bacillus on smears stained by the Unna-Pappenheim method (methyl green pyronine) was found to be the most important single diagnostic criterion of chancroidal infection.

3. Ducrey bacilli were identified in 88.5 per cent of the cases in routine smears from chancroidal ulcers.

4. The intradermal reaction to Ducrey vaccine proved to be specific and was found positive in about 95 per cent of cases.

5. The Ducrey vaccine test is more important when the results are negative, to exclude active chancroidal disease. When the reaction is positive it often indicates a past, healed infection.

6. The reaction to Ducrey vaccine remained positive in all cases after complete healing of the active lesion had taken place.

7. Chancroidal buboes were present in about 42 per cent of the cases.

8. Sulfanilamide was administered orally to 150 patients for fourteen days; a total of 45.6 Gm. (760 grains) in divided doses was found adequate.

9. Sulfathiazole was administered orally to 25 patients for ten days; a total of 20 Gm. (300 grains) in divided doses sufficed.

10. All definitely proved chancroidal infections healed with chemotherapy.

11. Surgical measures of any description were contraindicated and found unnecessary.

12. Aspiration of large inguinal abscesses was found sufficient in some cases. Spontaneous absorption of small abscesses took place in 5 cases during chemotherapy.

13. Reinfections occurred in 5 cases, and there was 1 questionable relapse; all the lesions healed promptly with a second course of chemotherapy.

14. Local application of sulfathiazole powder healed superficial chancroidal ulcerations. In 2 patients a relapse occurred, but the lesion responded promptly to oral therapy with sulfathiazole.

15. More than half (54 per cent) of the patients in our series were found to be infected with two, three or four venereal diseases during their observation.

16. Sulfonamide therapy may be used as a therapeutic test in the differential diagnosis of chancroid.

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Man Contrives His Own Undoing.—There was a time when men were content to grind their corn and use the flour as it came. It was good flour, but brown. They wanted it white, for reasons of social prestige. . . . So an important part of the grain was removed, just as the husk was removed from the rice by polishing, or as fat is cut from the meat by the butcher, or as much of the value of food is removed by refrigeration, by canning and by various modern devices whereby we make stale food appear fresh. Thus man contrives his own undoing. He pays the miller to remove the best part of the wheat, pays the scientist to find out what he's done, pays the chemist to make it for him again, and pays the miller to put it back. And we say that man's greatest asset in his power of reason.—Atkinson, Miles: *Behind the Mask of Medicine*, New York, Charles Scribner's Sons, 1941.

PHYSICAL FITNESS OF CHILDREN FROM DIFFERENT ECONOMIC LEVELS IN CHICAGO

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CHICAGO

For a number of years the Elizabeth McCormick Memorial Fund has been interested in the accumulation of a body of factual information on the general health and dietary practices of preschool and school age children in the Chicago area. Its regular health education program centers around a periodic examination by a pediatrician, followed by family consultations with a nutritionist. Approximately 1,500 children from six hundred families, largely from the low income levels, are examined each year in connection with this program.

In 1939, with the assistance of the Work Projects Administration,¹ a study was begun of the records of 10,000 children who had been enrolled in the Fund's health supervision classes during the preceding decade, and plans were made for examining during the next two years a large number of children from widely different economic levels. Since then more than 7,200 children from three thousand nine hundred families have been examined with one or both parents present.

This article presents observations on the incidence of certain health problems among 6,438 children who were examined between January 1939 and October 1940. The group was approximately equally divided as to sex: 3,253 boys and 3,185 girls. Their ages at the time of examination ranged from 2 years to 18 years, 88 per cent being between 5 years and 14 years of age.

SELECTION OF CASES AND CHARACTERISTICS OF COMMUNITY AREAS REPRESENTED

Contacts with the families were channeled through the public schools, private nursery schools and district offices of private and public welfare agencies. With the cooperation of the public school authorities, schools in distinctly different types of neighborhoods were selected and all children attending them (and their siblings) were given an opportunity to have the examination. Some of the best and some of the poorest neighborhoods in Chicago, representing various national and racial groups, were included. The proportion of pupils examined in these schools ranged from 33 per cent to 75 per cent of the children attending these schools. In general, parents in the better neighborhoods appeared more interested in having their children given the health check-up than those in poorer districts.

To insure an adequate sample of the relief population, special examining centers were established in settlements and in field houses in the parks. All families on the rolls of the Chicago Relief Administration having preschool or school age children who lived within walking distance of these centers were invited by letter. Examinations were always by appointment and on the condition that a parent would be present.

Districts of the city represented in the study included community areas in which the child population is

reported as densest according to the 1934 census data for Chicago.² A spot map showing the distribution of the selected neighborhoods is given in figure 1. Schools are indicated on the map by black squares and other centers by black circles. General conditions in these selected areas, as reflected by relief status, color and nativity of the families, and infant mortality and communicable disease morbidity rates,² present a wide distribution of economic and health problems. In approximately a fourth of the areas conditions were better than the average for total Chicago and in a fourth of them they were poorer.

The economic status of the families included in the study was determined from information given by the parent with regard to regularity of employment, type of occupation, extent of financial assistance from relatives or agencies, length of time on relief and annual income. Three broad economic categories were used: economically independent, marginal and relief.

Families that reported regular employment with no financial assistance from relatives or agencies during the two years prior to the examination (70 per cent had never received financial assistance) and a stable type of occupation at the time were classified as "economically independent." The majority of the reported incomes ranged from \$2,000 to \$4,000, 2 per cent being as high as \$10,000.

Families that were receiving financial assistance from either private or public agencies at the time of the examination were classified as "relief." The principal sources of relief were, in the order of frequency, Chicago Relief Administration, Mothers' Pension of the Juvenile Court of Cook County and United Charities of Chicago.

The "marginal" class included families not on relief at the time of examination but that were on the WPA rolls or had been on relief at some time during the past two years; families in which there was a history of irregular or seasonal employment or of recent employment after an extended lay-off; families living with relatives or friends and receiving some assistance from them, and families in which the wage earners were employed at low wage levels.

THE PHYSICAL EXAMINATION

Immediately preceding the physical examination a health history of each child was obtained from the parent—usually the mother. This history included information on antepartum care, delivery, infant feeding, general development, health habits and practices, immunization, an account of illnesses and accidents, a detailed inventory on the child's regular dietary and pertinent comments on leisure time activities, attitude toward school and playmates, management difficulties and methods used to control the child. Other information concerned a family history of tuberculosis and diabetes, clinic registrations and facts with regard to living conditions. This history, together with the record of certain body measurements (height, weight and, in some instances, girths) was in the physician's hands at the time the child appeared for the examination.

Young children and boys were examined without clothing; older girls were stripped to the waist. Results were dictated by the physician at the time of examination and recorded by an assistant on a prepared schedule. At the completion of the examination the physician

From the Elizabeth McCormick Memorial Fund.

1. Assistance in the collection and analysis of the data for this report was given by the Work Projects Administration (O. P. 65 1-54 2334)

2. Health Data Book for 75 Local Community Areas of the City of Chicago, Chicago, Chicago Board of Health and Tuberculosis Institute, 1939

stated his judgment on the child's general health status and listed the specific conditions for which remedial care was recommended. The record was then checked by him for accuracy and the mother was advised as to the child's health needs.

Reports on the physician's recommendations were sent to the medical case workers of the relief agencies involved, and the responsibility for follow-up care was assumed by the agency. Parents in the economically independent and marginal classes were advised to take the child to his private physician for the care recommended.

At the beginning of this study a special effort was made by the medical staff to agree on the meanings of descriptive terms used and the conditions under which certain types of recommendations would be made. All correctable defects were cited, regardless of whether or not there were facilities for taking care of them. For example, the need for orthodontia was indicated wherever it was noted, although it was doubtful whether families on relief or those on low incomes could arrange for this type of care.

Seven physicians participated in the investigation—four regular staff pediatricians and three who were engaged for this special study. The latter spent at least one week in observing and conferring on procedures used by the medical staff and in making examinations under their direction. A few weeks after the program was under way a number of children seen by one pediatrician were reexamined by him and by several other physicians on the same morning. To avoid any misunderstanding, the parents and teachers of the children who were selected for this recheck were informed of the plan and the reasons for it. Each physician was given a complete copy of the child's health history but no information on the previous examination. Variations in observations and ratings and in recommendations were later discussed in conferences and a further effort was made to insure comparable procedures and standards. Schedules were so arranged that each physician saw children from different economic levels.

Body measurements were taken under the personal supervision of a trained anthropometrist. Steel tapes, measuring boards and scales and the technic for using them were checked from time to time to insure comparability of results. Approximately 1 out of every 4 children examined was photographed without clothing or in shorts.

NATIONAL ORIGINS, SIZE OF FAMILY AND HOUSING

With few exceptions the children in this study were American born. Thirty-five per cent of them were of native white parentage, which is the proportion reported for total Chicago in the 1934 census. Nineteen per cent were of Negro and 5 per cent were of Mexican parentage.

The size of family varied directly with the economic classification, but large families (8 or more children)

were found at all income levels and among both the white and the Negro. The average number of children per family was 3. Among the Mexican families the average was 6 children, but the largest families were noted among the white native born. The range in size of family was from 1 child to 17 children. The largest family in the white economically independent class had 9 children, in the Negro 11.

Children examined were most frequently the first or second born in their families, but 3 per cent were the

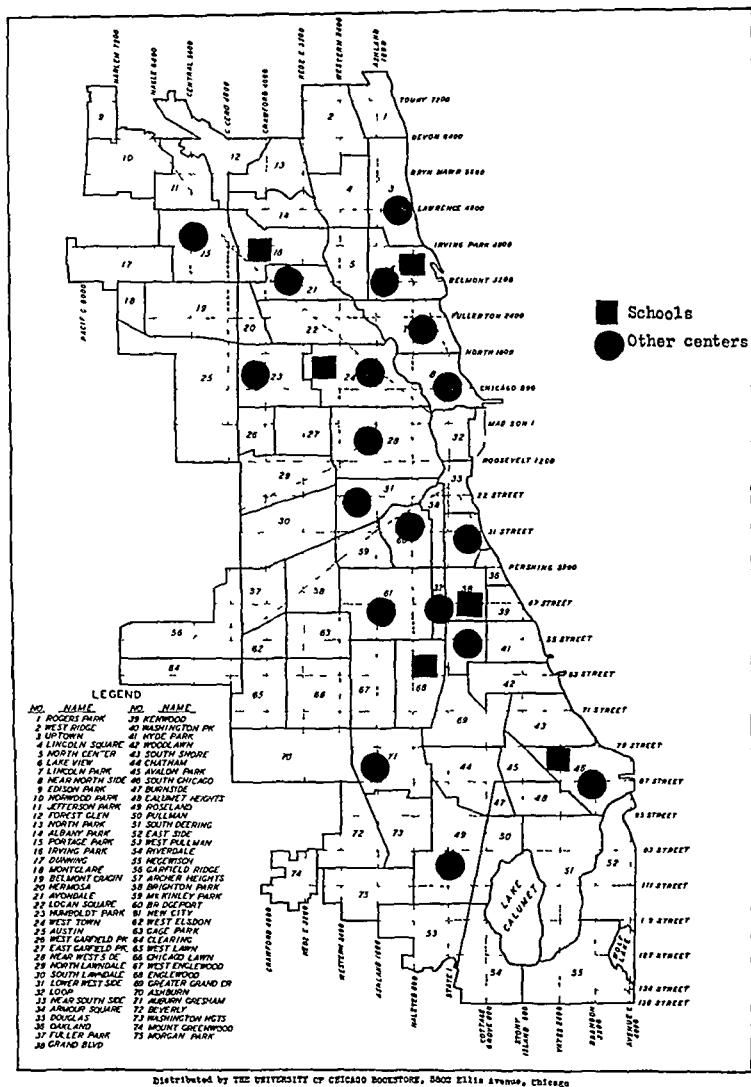


Fig. 1.—Distribution of selected neighborhoods in health study made between January 1939 and October 1940.

eighth or later born. All birth orders from first to seventeenth were represented.

The overcrowded conditions under which some of the families lived are strikingly evident in the sleeping arrangements for the children. In some instances as many as 6 children were reported as sleeping in one bed. The degree of crowding has been estimated in two ways: (1) the average number of persons per room in each household and (2) the number of bedfellows with whom the children examined were reported to sleep. Frequencies of various degrees of crowding among the different racial and economic groups are briefly summarized in table 1. Crowding was apparently more common among the families included in this study than

was noted in the sample population of Chicago in the National Health Survey (1935-1936).³ The National Health Survey reported that 25 per cent of the white families in Chicago were living more than one person per room and 46 per cent of the Negro families. Figures presented in table 1 show this degree of crowding in 35 per cent of the white and 67 per cent of the Negro families. However, these variations are to be expected, since the survey sample included all types of households, and the present study was restricted to those having children.

FAMILY HISTORY OF TUBERCULOSIS OR DIABETES

A history of tuberculosis in the families in this study was reported for 15 per cent of the white, 17 per cent of the Negro and 10 per cent of the Mexican children. This history was noted as frequently among the economically independent class as among those on relief—among the white, 15 per cent in the economically independent class and 14 per cent in the Chicago Relief Administration class; among the Negro, 19 per cent in

physical fitness are given in table 3. The weight status according to percentage deviations from standards for height and age is graphically shown in figure 2.

Medical Care as Related to Economic Status and Color.—Medical care was recommended in cases in which specific conditions were judged to deviate from the normal to the extent that professional remedial services were advisable or in which symptoms or history indicated a need for further examination or treatment.

Types of health problems most frequently noted by the physicians are given in table 2 for white and Negro children according to economic status of the family. Data on the Chicago Relief Administration cases are presented separately in the last two columns of the table.

There is no evidence in these observations of an association between need for medical care and economic status. The outstanding fact indicated is that most of the children examined, regardless of the family income level, needed medical attention. Sixty per cent of the children were in need of medical care, and their parents were so advised by the examiner.

TABLE 1.—Housing Conditions and Sleeping Arrangements of Chicago Children Examined Between January 1939 and October 1940, According to Color and Economic Class*

Color and Economic Class	Number of Persons per Room								Number of Persons per Bed					
	One or Less		More than One		More than One and a Half		Two or More		One		Two		Three or More	
	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent	Num-ber	Per Cent
White total....	1,502	65.0	606	24.7	131	6.3	123	5.0	1,943	41.4	2,284	48.7	405	9.9
Independent ..	1,001	83.0	163	13.5	23	1.9	19	1.6	1,204	69.9	525	29.0	20	1.1
Marginal ..	145	54.8	87	32.8	17	6.4	16	6.1	107	32.7	294	57.6	49	9.6
Relief total	446	45.4	356	36.3	91	9.3	88	9.0	512	21.6	1,405	61.7	396	16.7
Chicago Relief Admin- istration	257	43.6	235	36.1	63	10.3	66	10.1	329	20.3	959	59.2	331	20.5
Mexican total†	27	24.8	44	40.4	17	15.6	21	19.2	61	19.7	158	51.0	91	29.4
Relief total	24	24.1	42	42.4	16	16.2	17	17.2	53	18.7	143	50.5	87	30.8
Negro total	189	33.3	159	27.9	62	10.9	168	27.8	379	31.3	686	56.6	146	12.1
Independent	64	53.0	34	27.6	13	10.6	12	9.8	148	56.1	107	40.5	9	3.4
Marginal	25	32.0	26	33.3	8	10.3	19	24.3	51	33.6	89	58.6	12	7.9
Relief total	100	27.3	99	27.0	41	11.2	127	34.6	180	22.6	490	61.6	125	15.7
Chicago Relief Admin- istration	91	27.8	87	26.6	32	9.8	117	35.8	167	25.3	390	60.4	95	14.4

* Housing index based on number of families, sleeping arrangements on number of children examined

† Mexican total includes 10 nonrelief families

the economically independent and 15 per cent in the Chicago Relief Administration class. A grandparent or other near relative was reported more frequently in this history than a parent or sibling

Incidence of diabetes in the family was higher among the white than among the Negro (12 per cent of the white against 8 per cent of the Negro) and among the economically independent than among the relief class (16 per cent of the economically independent white against 8 per cent of the relief). These comparative differences are statistically significant

CONDITIONS FOUND ON PHYSICAL EXAMINATION

Results of the examinations are presented in terms of conditions requiring remedial professional care, general health ratings and the incidence of certain types of deviations from normal. The types of professional services most frequently needed are summarized in table 2. Figures on the incidence of certain conditions such as poor muscle tone, insufficient fat padding, round shoulders and flaring ribs and low ratings on general

Inspection of table 2 shows that a slightly larger proportion of white children in the independent class than in the total relief class required medical attention—59 per cent in the independent and 55 per cent in the relief. Comparisons with the marginal income class suggest that more medical care was needed by this class than by the others, but here again differences are not large—64 per cent of the marginal against 59 per cent of the independent and 55 per cent of the relief class.

Health problems were reported more frequently in the case of Negro than of white children. The incidence was higher in each economic category, the smallest variations occurring in the Chicago Relief Administration comparisons. In the independent class 59 per cent of the white compared with 70 per cent of the Negro were advised to have medical attention, and among the Chicago Relief Administration class 61.5 per cent of the white against 68.7 per cent of the Negro. The evidence here is conclusive.

The results give no indication of an association with nativity of parents. Differences between the white of native born parentage and other white rarely exceeded 1 per cent in either direction. Figures cited in table 2 for total white cases are practically the same as those for native white parentage cases.

3. Adequacy of Urban Housing in the United States as Measured by Degree of Crowding and Type of Sanitary Facilities; National Health Survey, Sickness and Medical Care, Bulletin 5, Washington, D. C., U. S. Public Health Service, 1938

Types of Medical Care Needed.—The remedial services advised by the physicians in their recommendations to the parents were for many different conditions. Those listed in table 2 represent the types of health problems observed in at least 1 out of every 100 children examined. Services most frequently needed were for orthopedic care. Among white children remedial services for abnormalities of posture or defects of the spine were advised in 12 per cent of the children and for abnormalities of the foot in 15 per cent of them.

The second ranking problem of medical care was that of ear, nose and throat conditions. Fourteen per cent of all children examined were in need of this type of medical attention, exclusive of surgery. In approximately 2 per cent of the children this care was advised because of ear conditions. Removal of tonsils and adenoids was recommended only if considered necessary by the pediatrician after a careful review of the history of infections. In 13 per cent of the children having tonsils, removal was advised.

Other problems in order of frequency related to conditions of eyes, skin, genitourinary system, heart and lungs. Remedial services for eyes, ears and nose were judged on inspection at the time of the examination and on the history—the eyes by general inspection, the ears and nose with an otoscope. Tests of visual acuity and of hearing were not made. The incidence of eye conditions needing professional care was 9 per cent; that of heart conditions 2 per cent, and that of lung conditions 2 per cent.

In general, these various types of medical care were needed no less by children from the higher economic level than by those from the low levels. Neither in frequency nor in type is there evidence of a relation between need for care and economic status.

Medical Care as Related to Age Level.—With the exception of eye conditions, incidence of medical attention varied little with age. In the case of eyes, as age increased there was a progressively larger proportion recommended for care. For example, the proportions in the independent class needing attention were 2 per cent at the preschool level, 5 per cent at ages 5-9 years, 10 per cent at ages 10-14 years and 14 per cent at ages 15-19 years; in the relief class these proportions were 2 per cent, 9 per cent, 11 per cent and 15 per cent respectively.

At all age levels the most frequent type of remedial service needed was orthopedic care. Corrections of abnormalities of the foot in the case of white children were recommended at different age levels in the following proportions, ranging from youngest to oldest: 17 per cent, 15 per cent, 13 per cent and 18 per cent.

Ear, nose and throat conditions again rank second in order of frequency, regardless of age level. Figures on recommendations for removal of tonsils and adenoids according to the age of the child differ little from those previously given for total cases. Among white children having tonsils, removal was advised in 9 per cent of the youngest children, 19 per cent of the next age level, 12 per cent of the next older and 8 per cent of those 15 years of age or older. Corresponding percentages for Negro children were 7, 13, 8 and 9.

These results tend to emphasize the widespread need for health service by children of all ages and different income levels.

Dental Care as Related to Economic Status and Color.—The majority of the children in the study (58 per cent) were reported to need dental care, exclusive of prophylaxis, and the lower the economic level the larger the proportion requiring corrective work. Undoubtedly these figures are an underestimation of the actual problem of dental care, since they are based on inspection by a physician rather than by a dentist. They serve to indicate the extensiveness of the problem among different economic classes and all age levels.

Significant differences between the white independent class and the relief class with respect to dental care are clearly indicated. Comparisons with the marginal class likewise show a consistent trend which justifies the conclusion that high incidence of dental defect is associated with low income level. Proportions of white children in each economic class who were advised to have corrections made were 52 per cent in the independent, 59 per cent in the marginal and 68 per cent in the relief—70 per cent in Chicago Relief Administration group.

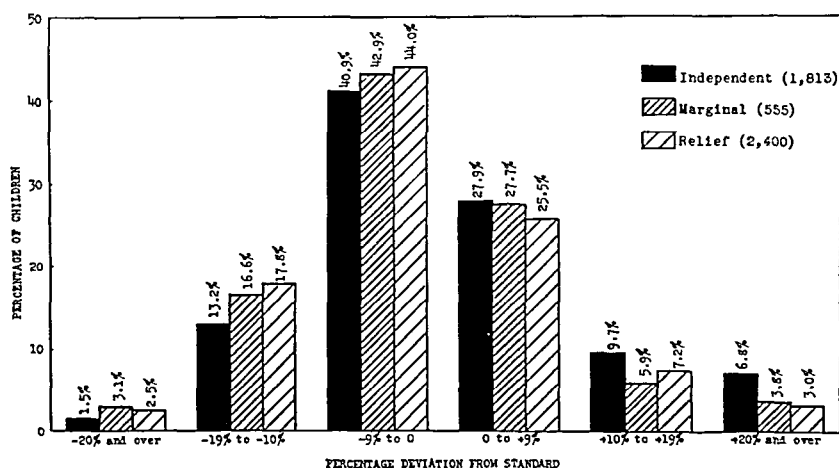


Fig. 2.—Weight status of 4,768 white children in Chicago, examined between January 1939 and October 1940, according to economic class, in terms of percentage deviations from the Baldwin-Wood standard.

These figures include all conditions of teeth judged by the physician to require professional attention.

Decided variations in the teeth of white and Negro children were apparent, a larger proportion of the white at each economic level having dental defects. Among the Negro children, the proportions according to economic class were 37 per cent in the independent, 46 per cent in the marginal and 52 per cent in the relief class. The relation to economic level is suggested, but the differences here are not statistically reliable.

At the time of the examination the physician reported the number of carious teeth observed. Analyses of these records show an average of more than one carious tooth per white child, 45 per cent having at least two teeth with cavities and 4 per cent having as many as eight carious teeth. In each economic class some cases with a large number of dental defects were reported. The averages for white children were as follows: independent class one and thirty-five hundredths carious teeth, marginal two and five hundredths teeth and relief two and three tenths teeth.

Need for dental care was noted at all ages but was least in evidence at the preschool level. Among children under 5 years of age, 23 per cent were reported to have dental defects. At all age levels the association

with economic status was indicated, though the differences were not always large.

Comparisons of white 10 year old children, one of the largest age groups, show an average of one and five tenths carious teeth per child in the independent, one and eighty-eight hundredths in the marginal and two and thirty-eight hundredths in the relief class. The proportions at this age having carious teeth were 56 per cent in the highest economic level and 65 per cent

the other extreme, 38 per cent were rated as in relatively poor condition—that is, their health status was definitely unsatisfactory.

In the judgment of the physicians, children from the lower income levels were less robust than those from the economically independent level. Health ratings of those in the independent class show a significantly larger proportion in excellent condition and a smaller proportion in poor condition. Ratings indicative of

TABLE 2.—Frequency of Certain Types of Health Problems Among 6,053 White and Negro Children in Chicago Examined Between January 1939 and October 1940, According to Economic Class

Protective and Remedial Health Services Recommended	Independent				Marginal				Total Relief				Chicago Relief Administration			
	White (1,831)		Negro (266)		White (534)		Negro (153)		White (2,456)		Negro (813)		White (1,646)		Negro (665)	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
None recommended.....	173	9.4	38	14.3	44	8.2	3	2.0	218	8.9	43	5.3	103	6.3	34	5.1
Medical care.....	1,083	59.1	187	70.3	344	64.4	118	77.1	1,351	55.0	560	68.9	1,012	61.5	459	68.7
Eyes *	127	6.9	12	4.5	55	10.3	15	9.8	248	10.1	77	9.5	170	10.3	68	10.2
Ears,* nose, throat....	258	14.1	39	14.7	81	15.1	28	18.3	338	13.8	129	15.9	278	16.9	122	18.3
Tonsillectomy and adenoidectomy †....	129	13.2	17	7.8	60	16.9	9	7.4	241	15.7	75	11.3	201	18.4	34	6.2
Skin.....	46	2.5	4	1.5	16	3.0	9	5.9	96	3.9	24	3.0	72	4.4	21	3.1
Allergy.....	39	2.1	0		4	0.7	0		13	0.5	8	1.0	8	0.5	7	1.0
Endocrine.....	19	1.0	2	0.8	7	1.3	0		10	0.4	4	0.5	10	0.6	4	0.6
Spine.....	324	17.7	41	15.4	67	12.5	32	20.9	190	7.7	61	7.5	166	10.1	57	8.5
Feet.....	340	18.6	109	41.0	77	14.4	66	43.1	286	11.6	223	27.4	189	11.5	186	27.8
Lungs.....	19	1.0	4	1.5	6	1.1	2	1.3	52	2.1	23	2.8	46	2.8	23	3.4
Cardiac.....	23	1.3	2	0.8	14	2.6	3	2.0	50	2.0	19	2.3	30	1.8	17	2.5
Genitourinary.....	30	1.6	20	7.5	13	2.4	12	7.8	58	2.4	23	2.8	44	2.7	23	3.4
Urinalysis.....	28	1.5	8	3.0	12	2.2	6	3.9	37	1.5	23	2.8	33	2.0	23	3.4
Enuresis.....	23	1.3	12	4.5	20	3.7	6	3.9	73	3.0	36	4.4	64	3.9	31	4.6
Dental care.....	946	51.6	98	36.8	315	58.9	70	45.8	1,077	68.3	424	52.2	1,156	70.2	348	52.1
Immunization																
Vaccination.....	370	20.2	58	21.8	132	24.7	31	20.3	468	19.1	215	26.4	334	20.3	171	25.6
Schick.....	685	37.4	79	29.7	195	36.4	50	32.7	702	28.6	245	30.1	515	31.3	216	32.3

* Based on gross examination—no sensory tests.
† Percentages based on number of children having tonsils.

TABLE 3.—Frequency of Certain Physical Defects Among 6,385 Children in Chicago, Examined Between January 1939 and October 1940, According to Color and Economic Class

	Total						White						Negro						Mexican		Chicago Relief Administration					
	White (4,821)		Negro (1,232)		Mexican (332)		Inde- pendent (1,831)		Marginal (534)		Total Relief (2,456)		Inde- pendent (266)		Marginal (153)		Total Relief (813)		Total Relief (302)		White (1,646)		Negro (665)		Mexican (200)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Muscles flabby...	1,207	25.2	375	30.7	82	25.0	456	25.0	160	29.6	592	24.3	78	29.7	72	47.1	225	27.8	74	24.8	400	24.4	166	24.9	57	22.0
Posture poor....	2,010	42.9	573	47.5	141	43.3	625	34.3	241	46.3	1,144	48.8	116	45.0	100	66.7	357	44.7	126	42.1	759	47.0	298	44.9	105	40.7
Fat insufficient..	1,032	21.6	528	43.1	66	20.1	165	9.0	99	18.5	768	31.6	119	44.9	75	49.0	334	41.4	69	19.6	482	29.5	261	39.4	48	18.5
Mucous mem- brane pale.....	877	18.7	356	29.7	35	10.7	296	16.4	119	22.9	462	19.5	88	34.0	64	43.5	204	25.8	30	10.0	254	15.8	157	23.9	26	10.1
Shoulders round	1,501	31.7	354	29.0	91	29.4	526	28.9	178	33.7	797	33.0	89	34.0	61	39.9	204	25.3	86	27.3	590	36.2	183	28.3	81	39.4
Ribs flaring..	1,052	22.1	319	26.2	55	17.0	158	8.7	99	18.8	795	33.0	61	22.9	51	34.0	207	25.8	50	17.0	605	31.1	178	26.9	42	16.6
Legs.																										
Bowed. . .	1,906	42.0	708	59.2	144	43.5	483	28.9	215	50.3	1,208	51.4	128	52.5	120	77.4	460	57.8	129	43.0	864	53.4	397	60.4	102	39.6
Knock kneed	603	13.3	150	12.5	59	17.8	163	9.7	84	16.2	356	15.1	23	9.4	18	11.6	109	13.7	54	18.0	206	12.7	86	10.0	47	18.1
Feet:																										
Pronated....	648	13.6	423	34.3	48	14.6	231	12.6	83	15.5	334	13.8	131	48.9	69	43.9	223	27.3	45	15.0	199	12.4	179	27.0	32	12.5
Flat.....	410	8.6	220	18.6	36	11.0	167	9.2	51	9.5	192	7.9	43	16.0	39	24.8	147	18.0	30	10.0	88	5.5	112	16.9	23	9.0
Carious teeth, 2 or more..	2,117	44.9	587	41.9	175	53.5	602	33.5	217	45.7	1,278	53.2	48	18.2	45	29.6	294	36.8	166	55.9	907	55.5	244	37.0	118	57.8
Heart																										
Functional	51	1.7	14	4.4	7	2.1	25	1.4	9	1.7	47	1.9	16	6.0	8	5.3	30	3.7	6	2.0	20	1.8	25	3.8	6	2.3
Organic	55	0.7	12	1.0	3	0.9	8	0.4	5	0.9	22	0.9	1	0.4	1	0.7	10	1.2	3	1.0	9	0.5	8	1.2	3	1.2
Underweight 10 to 14 %	307	11.0	199	16.1	27	8.3	167	9.2	60	14.1	280	11.8	30	11.5	26	17.1	140	17.3	23	7.8	200	12.4	112	16.9	21	8.2
15% or more	339	7.3	135	11.1	13	4.0	196	5.8	33	7.7	200	8.5	23	8.9	26	17.1	86	10.7	12	4.1	154	9.6	77	11.6	8	3.2
General condition unsatisfactory or poor.....	1,744	36.7	569	45.9	122	41.4	383	21.0	211	41.7	1,150	47.7	93	34.9	84	54.5	383	47.9	110	37.3	793	48.6	206	45.8	95	36.5

and 73 per cent in the lower levels. The range was from no caries to eleven affected teeth and was the same for the high and low income classes.

Health Ratings as Related to Economic Status and Color.—Immediately after the examination, the detailed observations were summarized by the physician in the form of a rating, which described his impression of the child's general physical condition. Analyses of these ratings show that only 6 per cent of the children examined were described as in excellent health. At

excellent health were three times as frequent at the economically independent level as at the relief level and twice as frequent as at the marginal level. Frequencies of high and low health ratings, which describe the most and least robust, by economic class, are given in table 4.

Differences between the marginal and relief classes were neither consistent in direction nor statistically significant. There is little indication in these ratings that the children in the marginal class were either more or less healthy than children in the relief class.

The trend of the ratings was the same at all age levels, and in the case of children between the ages of 5 years and 14 years the differences are statistically significant. It seems safe to conclude that children in the economically independent class were in better general health than the other children of like ages.

There was no association between high or low ratings in health and differences in age. The physical condition of the young children was considered by the physician as neither better nor poorer than that of the older children. For example, the proportion at each age level rated as in excellent health, in order of increasing age, was 6 per cent, 6 per cent, 7 per cent and 4 per cent.

White children were found to be in better condition than the Negro or Mexican children. Ratings indicative of good health were reported more frequently in the case of white children and poor conditions less often than in either of the other groups.

Incidence of Certain Physical Conditions.—Comparative results on the incidence of certain physical deviations from normal are summarized in table 3. The first section of the table reports incidence of the conditions among white, Negro and Mexican children without regard to economic status. The center sections present the data according to economic level. In the last section results are shown for the Chicago Relief Administration group.

The high frequencies noted, among both white and Negro children from different economic classes, of flabby muscles, poor posture, round shoulders, bow legs, defective feet and carious teeth offer definite proof of the unsatisfactory physical condition of a large proportion of these urban children. In at least 1 out of every 4 children examined, regardless of the economic level of the family, some of these defects were observed.

Defects of teeth outrank all other physical deviations among the children in this study, but the incidence of many others is high. In order of frequency, exclusive of teeth, the most common conditions were bow legs 45 per cent, poor posture 44 per cent, round shoulders 31 per cent, flabby muscles 26 per cent, deficient fatty tissue 26 per cent, flaring ribs 23 per cent and pale mucous membrane 20 per cent. The figures cited for bow legs represent various degrees of bowing, relatively few cases showing an extreme degree.

A number of these conditions appeared to be associated with the economic level, but on the whole the incidence was high in each income class. The results with respect to fatty tissue in the case of white children clearly warrant the conclusion that a deficiency in fat padding was most frequent at the lowest income level and least frequent at the economically independent level.

Underweight in Relation to Economic Status and Age Level.—A distribution of weight status in terms of percentage deviations from expected weight for age, sex and height, according to Baldwin-Wood tables, is presented in figure 2 for white children at different economic levels. Cases exactly at standard (zero deviations) have been thrown half to the underweight and half to the overweight frequencies. Inspection of the graph will show that the weight status of approximately a fourth of the children is suggestive of poor nutrition—they were underweight 10 per cent or more or overweight 20 per cent or more.

Analyses of the underweight children (those 10 per cent or more below the norm) reveal a significantly smaller proportion in the independent class below standard than in the other economic classes. While the comparative differences are not large, they give evidence of the higher incidence of underweight at the low income levels than at the economically independent level. The trend of these results is in agreement with that indicated in the doctor's reports on insufficient fat padding.

Among the total children examined 20 per cent were found to be underweight; among the economically independent class 16 per cent and among children in the Chicago Relief Administration class 22 per cent. While the standards used are open to criticism from a number of standpoints, in the light of figures from other investigations based on the same standards the present results are probably an underestimation of the extent to which the children in this study deviated from an optimum condition.

Within the age range which included the majority of the children (2-14 years) there is a systematic increase with advancing years in the proportion of underweight among white children. Differences are not large but are progressive and, in the case of the relief class, are statistically significant. For example, in the

TABLE 4.—Percentage of Children Having High and Low Health Ratings According to Color and Economic Class

	High Health Ratings		Low Health Ratings	
	White	Negro	White	Negro
Economically independent	13.4%	8.6%	21.0%	34.9%
Marginal.....	4.9%	3.9%	41.7%	54.5%
Relief total.....	3.4%	2.0%	47.7%	47.9%

white relief class, 6 per cent of preschool age children were underweight, 16 per cent of those in the 5 to 9 year age level and 24 per cent of those 10 years and over. No consistent trend was observable in the results on Negro children.

At all age levels and in all groups a larger proportion of girls than boys was underweight. In the total group, 25 per cent of the girls and 15 per cent of the boys were as much as 10 per cent below the expected weight standard.

ILLNESS AS RELATED TO ECONOMIC STATUS

A history of illnesses and accidents together with comments from the mother on severity and age at the time of the illness was obtained prior to the physician's examination. A check list of diseases was used to assist the mother in recalling the history. Questions on the frequency of colds, coughs, sore throat, headaches, constipation and nervous habits were included.

Analyses of the records on illness indicated an average of three different types of sickness episodes per child in each economic class and racial group. The results yield no evidence of a greater amount of sickness among the children from the low income levels. Among 10 year old white children 11 per cent were reported to have had six or more illnesses—the proportion in the economically independent class was 14 per cent, that in the relief class 7 per cent.

Injuries by an accident of some type were reported in 18 per cent of the cases, the figures being identical for white and Negro and practically the same for all economic classes. Approximately half of the children

had had a surgical operation—57 per cent of the white and 42 per cent of the Negro children.

As would be expected, removal of tonsils and adenoids was the most frequent type of operation reported. The proportion in the white group having had this type of operation was 40 per cent, in the Negro group 18 per cent; among the Chicago Relief Administration cases the figures were 33 per cent in the white group and 18 per cent in the Negro; among the marginal class 32 per cent in the white and 20 per cent in the Negro group. The incidence of removal of tonsils and adenoids among white children 10 to 14 years of age varied directly with economic status, but only in comparisons of the independent with the relief class is the difference statistically significant.

A history of frequent colds, coughs or sore throats was reported in a third of the cases. The incidence did not appear to be related to economic level or color. The proportions having this history were as follows: in the independent class, 31 per cent of the white and 40 per cent of the Negro children; in the marginal class, 33 per cent of the white and 38 per cent of the Negro; in the Chicago Relief Administration class, 35 per cent of the white and 33 per cent of the Negro.

Records on nervous habits among these children give no indication of differences between the economic classes with respect to incidence of enuresis, nail biting, speech difficulties or like habits. The majority of the children in each income class and racial group had no history of these conditions. The frequency in percentage among white children as reported by the mothers is given in table 5.

IMMUNIZATION STATUS AS RELATED TO ECONOMIC LEVEL AND AGE

The need for immunization was estimated on the basis of the physicians' recommendations concerning smallpox vaccination and the Schick test. Inspection of the records showed that 21 per cent of the children in the study had not been vaccinated and 34 per cent had not been immunized against diphtheria.

The incidence of the need for immunization was closely associated with age, recommendations for this protection being most frequent at the younger ages. Among children under 5 years of age 55 per cent had not been vaccinated and 29 per cent had not been immunized against diphtheria. At ages 10 years and older the figures were 13 per cent needing smallpox vaccination and 34 per cent the Schick test.

TABLE 5.—Incidence of Nervous Habits in White Children of Different Economic Classes

	Economically Independent (1,247)	Marginal (537)	Chicago Relief Administration (1,666)
Enuresis	10.1%	16.2%	15.4%
Nail biting	26.9%	25.6%	22.7%
Speech difficulties	10.7%	9.0%	6.3%
Other habits	23.0%	16.4%	12.7%

At the relief level a much larger proportion of the children were not made immune to smallpox or diphtheria than at the higher income levels. The figures with respect to children under 5 years of age according to economic class are given in table 6.

These results are disappointing in the light of the active campaign carried on in Chicago over a number of years for the immunization of preschool and school children. The results are, however, in agreement with reports from other public health programs. In a recent

evaluation of a six year program in Tennessee⁴ in which preschool immunization was emphasized, the results from the last year (1936) show that 43 per cent of the white 6 and 7 year old children at the time of their first examination had not been immunized against diphtheria. During the entire period of preschool supervision, only 31 per cent of the white children of these

TABLE 6.—Percentage of Children Under 5 Years of Age in Need of Immunization Against Smallpox and Diphtheria, According to Economic Class

	Smallpox Vaccination Advised	Schick Test Advised
Economically Independent.....	44%	20%
"	43%	20%
"	71%	37%
"	74%	41%

ages on entering school were found to have been vaccinated against smallpox.

DIETARY PRACTICES IN RELATION TO ECONOMIC STATUS AND COLOR

A detailed account of the findings on dietary practices of the children included in this study is to be reported in the near future. As they are definitely a part of the health picture presented in this paper, the trend of the data with little explanation of the technic employed will be given at this time.

Adequacy of protective foods in the diet was evaluated in terms of the number of weekly servings of these foods. Classifications were based on the four diet levels outlined by the U. S. Department of Agriculture (1936),⁵ namely (1) liberal diet, (2) moderate cost adequate diet, (3) minimum cost adequate diet and (4) restricted diet for emergency use. In this study diets below the restricted diet level were treated as a fifth classification. Attention should be called to the fact that diet levels 3 and 4 are both below the recommended dietary allowances of the Committee on Food and Nutrition of the National Research Council (1941).

The level of the diet was closely associated with the economic status. Poor diets were found more frequently in the relief class than in the higher income classes and good diets much less often. The figures with respect to weekly servings of fruits and vegetables, including potatoes, offer striking evidence of this relationship. Diets having less than the minimum of eighteen servings of these foods a week, which is below the level of the restricted diet for emergency use, were noted in the following proportions: independent class 10 per cent, marginal income class 32 per cent, Chicago Relief Administration class 64 per cent.

In general, the diets of Negro children were less adequate than those of white children. Variations were consistent and statistically significant at different economic levels, but the differences were greater at the higher levels. Records on consumption of fruits and vegetables, including potatoes, show the following proportion below the minimum standard: independent—white 8 per cent and Negro 23 per cent; marginal—white 25 per cent and Negro 46 per cent; Relief Administration—white 62 per cent and Negro 69 per cent.

4. Walker, W. F., and Randolph, Carolina R.: School Health Services: A Study of the Programs Developed by the Health Departments in Six Tennessee Counties, Commonwealth Fund, 1941, pp. 119 and 120, 1, 11, 87 and 88.

5. Carpenter, Rowena Schmidt, and Stielcing, Hazel K.: How to Fit the Family Income, U. S. Department of Agriculture, Service Bulletin 1757, 1936.

The results clearly reflect the need for health education among the urban families included in this study. It is significant that, when judged on a standard currently considered very low, namely restricted diet for emergency use, 10 per cent of the children in families who could afford to buy adequate amounts of fruits and vegetables were getting them in amounts below this level, which is not sufficient to maintain good health. When compared with the dietary allowances of the Committee on Food and Nutrition, the fruit and vegetable intake of more than half of the children (51 per cent) from these economically independent families was found to be below the recommended allowances.

SUMMARY AND CONCLUSIONS

Analyses of the health records of 6,438 children representing widely different income levels and various types of community areas in Chicago, who were examined by pediatricians in 1939 and 1940, furnish factual evidence on the extensiveness of the health problem at different economic levels. The results on physical fitness may be briefly summarized as follows:

1. Need for professional health services:

(a) Children from nonrelief families were no less in need of professional care than those from relief families.

(b) Variations between the different income levels with respect to incidence and type of medical care needed were small and not statistically significant.

(c) The incidence of health services advised by the physicians was as follows:

(1) Sixty per cent of the children were in need of medical care.

(2) Fifty-eight per cent of them were in need of dental care (according to observations of pediatricians).

(3) Thirty-four per cent had not been immunized against diphtheria (29 per cent of the children under 5 years of age).

(4) Twenty-one per cent had not been vaccinated against smallpox (55 per cent of the children under 5 years of age).

2. Association of low income with poor physical conditions which may not have required professional services:

(a) Ratings indicative of poor general health were reported more frequently and of good health less often in the lower income classes.

(b) The incidence of carious teeth was higher at the lower income levels.

(c) Underweight was noted more frequently in the low income classes.

(d) Observations of insufficient amount of fat padding, poor posture, round shoulders, flaring ribs and bow legs was more frequent at the low income levels.

3. Health differences between white and Negro children:

(a) A larger proportion of the Negro than of the white children were in need of medical care.

(b) Ratings indicative of poor general health were reported more frequently and of good health less frequently in the case of Negro than of white children.

(c) The incidence of underweight and of other signs of unsatisfactory physical condition was higher in the Negro than in the white group.

4. Adequacy of diet:

(a) Adequacy of diet was directly associated with economic status. Poor diets were more frequent at the lower levels and good diets at the higher income levels.

(b) The intake of fruits and vegetables was inadequate at all income levels—39 per cent of the children were having less than the minimum requirements for the protection of health.

(c) Inadequate diets were noted more often among the Negro than among the white children.

Evidence of the need for health supervision and health education at all economic levels is strikingly shown by the results of this study. Poor nutrition is clearly manifest in a composite of flabby muscles, underweight, pale mucous membranes, round shoulders, fatigue posture, bow legs, knock knees, flat feet, carious teeth and inadequate diets. At no income level is the general health picture satisfactory, but at the low levels it is definitely unsatisfactory.

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FOCAL INFECTION

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For a long time it had been recognized that acute inflammatory disease in a certain region of the body could produce secondary inflammation in some other region. Nevertheless, it was not until after the work of Billings and his co-workers that the conception that chronic, often symptomless, infections of low grade, localized in various parts of the body, could produce disease elsewhere in the body, began to receive general recognition from members of the medical and dental profession in this country. Rosenow¹ stated "The scope of this influence may be judged by the voluminous literature on focal infection that has appeared [since the publications of Billings] throughout the whole civilized world, and in which striking benefit to patients suffering from various diseases and also failure of others to improve have been reported." Although earlier diligence was directed largely to the reporting of the "striking benefits," there has lately appeared a tendency to focus the regard on the "failure of others to improve." This tendency seems to have reached a culmination in the recent paper of Reimann,² in which he found no evidence to support the conception that such an entity as focal infection exists.

Although it is admittedly difficult clinically to distinguish sharply the stage in which chronicity begins, there seems to be a tendency on the part of physicians to admit the validity of the conception of acute foci of infection without demur. There also seems to be great reluctance on the part of some investigators to admit that toxins or bacteria from a site of long-standing infection can enter the circulatory system to set up secondary disease in other regions. The explanation for this suggested difference in bodily reaction does not seem to have been satisfactorily explained by the opponents of the theory of "focal infection."

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From the Division of Medicine (Drs. Slocumb and Binger), the Section on Cardiology (Dr. Barnes) and the Section on Otolaryngology and Rhinology (Dr. Williams), Mayo Clinic.

1. Rosenow, E. C.: Focal Infection and Elective Localization, *Internat. Clin.*, 2: 29-64 (June) 1930.

2. Reimann, H. A., and Havens, W. P.: Focal Infection and Systemic Disease: A Critical Appraisal; the Case Against Indiscriminate Removal of Teeth and Tonsils, *J. A. M. A.* 114: 1-6 (Jan. 6) 1940.

There are probably few physicians who have not observed a sudden and puzzling relief of a patient's symptoms following removal of a "chronic" focus of infection. Such improvement may occur with sufficient infrequency, however, to justify recent expressions of doubt as to the etiologic significance of the focus and also doubt as to whether or not a causal relationship had existed between the focus of infection and the disease which apparently yielded to the therapeutic procedure.

Although bacteriologists³ have been extremely critical of proof obtained on the basis of clinical evidence alone, the debate and controversy arising from their several attempts to conclude the discussion of focal infection by exact scientific methods constrain us to avoid this particular aspect of the subject and to attempt evaluation of the conception of focal infection on the basis of clinical observations alone. To do this we feel that we must limit ourselves to observations of certain well defined disease entities and attempt evaluation of such clinical improvement as may or may not seem to have occurred following removal of a focus or foci of infection. We shall confine ourselves to a consideration of the effects of removal of such foci of infection as occur in the field of otolaryngology and we shall try to assess the effect of removal of foci of infection in heart disease, chronic infectious arthritis and glomerulonephritis, since these three conditions are representative of those in which removal of foci of infection has been said to be of clinical benefit.

HEART DISEASE

For the purpose of the present consideration, heart disease has been subdivided into several clinical entities.

Coronary Sclerosis.—This condition, depending as it does on certain irreversible changes in the walls of the coronary arteries, would seem to us to be unlikely to be diminished by removal of foci. The thesis that toxic absorption from foci of infection over a long period can produce such chronic degenerative changes as sclerosis of the coronary vessels is impossible either to prove or disprove on the basis of data available. Coronary thrombosis,⁴ it has been suggested, in certain instances may have a bacterial background and if so would then seem to depend on transient bacteremia⁵ such as is associated with acute infections of the upper part of the respiratory tract, and on acute exacerbations of chronic foci of infection somewhere in the organism.

Hypertensive Heart Disease.—This condition has been the subject of much clinical discussion and experimentation since the work of Goldblatt and may be considered to be in a state of flux. It will not be considered in this paper.

Syphilitic Carditis.—This disease has a well authenticated cause; thus it can be eliminated readily as a product of focal infection.

Acute Pericarditis.—This condition is usually bacterial in origin and in all probability depends for its appearance on the presence of transient bacteremias⁶ from acute and possibly chronic foci.

Chronic Pericarditis.—Chronic pericarditis is the end result of an infection rather than an active process itself and can be dismissed from consideration herein.

Cor Pulmonale.—Where cor pulmonale (or dilatation of the right side of the heart secondary to obstruction of the pulmonary circulation) depends for its origin on chronic asthma with secondary emphysema, it obviously cannot be caused by focal infection. When chronic emphysema is secondary to chronic bronchitis, however, the role possibly played by infection in the tonsils and paranasal air spaces cannot be dismissed so summarily. Larsell and Fenton,⁷ in demonstrating the lymphatic connections between the paranasal sinuses, the tonsils and the peribronchial lymph nodes, suggested an etiologic relationship between chronically infected tonsils or sinuses and the ultimate development of chronic infection of the tracheobronchial tree. Elimination of such a focus of infection must be obtained before an irreversible process, such as emphysema with pulmonary hypertension, has taken place, because elimination of the focus of infection after the development of such a symptom complex could offer but little toward amelioration of the condition.

Rheumatic Carditis.—The evidence for and against focal infection as an etiologic agent in rheumatic carditis must be considered carefully, because the earlier enthusiasm displayed by some investigators for such a relationship seems to have subsided. In reviewing earlier literature on the influence of tonsillectomy on the recurrence of rheumatic fever, Cohn suggested that the period of observation following operation usually was too short to allow adequate evaluation of results, since it had been found that the percentage of recurrence increases with the passage of time. May Wilson⁸ in her recent monograph included a careful study of 413 rheumatic children, 247 of whom had tonsils removed either before or after the first rheumatic infection. The remaining 166 children served as controls. Wilson came to the conclusion that removal of the tonsils seems to have no effect on either the appearance or the recurrence of rheumatic activity. It seemed to her that the value of tonsillectomy for rheumatic children was proportional to its influence on the general health of the child. Our own opinion concerning the influence of the tonsils on rheumatic fever is in accord with that of Wilson.

On the basis of our clinical experience we feel, therefore, that in heart disease focal infection can be considered to be a factor only in an occasional case of coronary thrombosis or acute pericarditis, and in the small group of cases in which emphysema and pulmonary hypertension result from chronic bronchitis secondary to infection in tonsils or sinuses.

We also believe that, in the presence of an old valvular lesion, removal of septic tonsils (especially following quinsy), removal of badly infected teeth or drainage of seriously diseased sinuses must be done with circumspection. Elliott⁹ has shown that surgical intervention in very marked foci of infection might produce bacteremia which, exerting an adverse effect on an injured valve, might be the starting point for subacute bacterial endocarditis. The practice of preceding surgical intervention with infections in the presence of chronic valvular injury with chemotherapy by sulfonamide compounds can be recommended, we believe, on theoretical, experimental and clinical grounds.

3. Rosenow, E. C., quoted by Reimann and Havens.²
4. Rosenow, E. C.: A Bacteriologic Study of Pulmonary Embolism, *J. Infect. Dis.* 40: 389-398 (March) 1927.
5. Oille, J. A.; Graham, Duncan, and Detweiler, H. K.: Streptococcus Bacteremia in Endocarditis, *J. A. M. A.* 65: 1159-1163 (Oct.) 1915.
6. Libman, Emaquel: Consideration of the Prognosis in Subacute Bacterial Endocarditis, *Am. Heart J.* 1: 25-40 (Oct.) 1925.

7. Larsell, Olof, and Fenton, R. A.: Lymphatic Pathways from the Nose: Research Report, *Arch. Otolaryng.* 24: 696-713 (Dec.) 1936.
8. Wilson, May G.: Rheumatic Fever: Studies of the Epidemiology, Manifestations, Diagnosis and Treatment of the Disease During the First Three Decades, London, Commonwealth Fund, 1940.
9. Elliott, S. D.: Bacteremia and Oral Sepsis, *Proc. Roy. Soc. Med.* 22: 747-754 (May) 1939.

CHRONIC INFECTIOUS ARTHRITIS

In chronic infectious arthritis a condition of admittedly unknown causation is encountered. Hench¹⁰ summarized all the arguments which have been made for and against the microbic theory of origin of this disease. He found that the argument in favor of the theory rested on twenty-one points, each of which for reasons given was discounted by opponents of the theory. Hench formed two conclusions, one on the basis of his work as a clinical investigator, the other on his experience and needs as a practicing physician. "As a clinical investigator," he wrote, "I must conclude that the cause of atrophic arthritis is still unknown and that the evidence for infection, although very impressive, is incomplete. Invoking the privileges of a clinical investigator I cannot and need not now decide for or against the microbic theory with any finality. As a practicing physician, however, I cannot wait until the evidence is complete. The exigencies of practice force one to express an opinion one way or another. . . . Therefore, as a practicing clinician I have committed myself to the microbic theory." With this statement we are in accord.

It is our opinion that the treatment of chronic infectious arthritis should be individualized. A systemic disease, "it is no more a disease of joints than typhoid fever is a disease of Peyer's patches" (Pemberton). No single form of treatment is adequate, and in evaluating the results of treatment the physician must rely on objective improvement rather than on the patient's subjective relief, lest he be misled by the psychic effects on the patient inherent in any therapeutic measure.

Many physicians regard elimination of foci of infection as the measure of first importance in treatment.¹¹ Others have not been favorably impressed by results of removal of such foci. Miller¹² believed that the removal of foci was included with other therapy, a practice which clouded the issue. He considered it unfortunate that removal of chronic foci of infection should be considered by so many physicians or investigators to be the first and major treatment, since this procedure had resulted in the loss of much valuable time which might have been used more profitably in other directions.

However, the fact that removal of chronic foci of infection is not followed by rapid or notable relief does not invalidate the importance of eradication of such foci. Several workers have insisted that results of removal of foci of infection may be poor because often more than one focus is present. Foci are too often imperfectly removed, and indeed it is impossible to eradicate them if the focus is not local but is diffuse (for example, nasopharyngitis). Last, too much may be expected of removal of foci of infection in the presence of irreversible articular pathologic change.

Buckley¹³ at times noted most remarkable improvement, and even cure, to result from removal of foci and expressed the belief that following removal of foci of infection complete recovery has occurred a sufficient number of times to indicate that such foci may be of etiologic importance in arthritis. The changing views of one authority on arthritis were reported by Cecil and

Angevine.¹⁴ In 1927 Cecil and Archer¹⁵ reviewed 200 cases of chronic infectious arthritis in which focal infection seemed to play a major role in the causation of the disease. In 1938, however, in an analysis of 200 new cases of rheumatoid arthritis, Cecil and Angevine came to the conclusion that although undoubtedly there are instances of chronic infectious arthritis which result from focal infection as far as typical rheumatoid arthritis is concerned, it would appear that chronic focal infection plays a comparatively unimportant role. In the same year in a quarter-century survey of focal infection, Bierring¹⁶ approved the more conservative attitude which has developed with reference to hasty diagnostic conclusions and radical removal of suspected foci of infection, but he considered that clinical and bacteriologic evidence had afforded definite confirmation of the fundamental conception of focal infection and felt that perchance focal infection may yet become the medical guide of the future.

On the basis of our own experience, we feel that, given a patient who has chronic infectious arthritis and in whom a definite focus is present, the focus should be eradicated as soon as the patient's general condition warrants surgical treatment. The decision as to the optimal time to remove a focus should rest with the clinician rather than with the laryngologist. Although we feel that focal infection should be eliminated as early as possible when chronic infectious arthritis is present, we prefer a period of observation to elapse before surgical intervention is attempted, so that we can be sure that progression of symptoms is under control. We prefer that the patient's condition is such that fever is absent or slight, that anemia is improving and that loss of weight has ceased. With attention to these factors, we rarely encounter a flare-up in symptoms of chronic infectious arthritis after surgical elimination of a focus of infection has been carried out. Although it is admittedly impossible to assess accurately the improvement produced by removal of a focus of infection from a patient who, at the same time, is receiving other forms of therapy, we believe that we can expect real diminution in symptoms of definite clinical importance to result from such removal for 5 per cent of patients whose infected tonsils are the only discoverable focus. The same results can be obtained for approximately 4 per cent of patients whose sinusitis seems to be the source of infection.

We encounter many patients who report diminution in symptoms of chronic infectious arthritis after any type of surgical intervention or even general anesthesia has been carried out, but the improvement persists for from three to seven days and then is gradually lost. Improvement which we feel to be of clinical importance is pronounced and is maintained permanently following surgical eradication of a given focus. For the remainder of the patients the operation is of value only for the effect it may have in improvement of the general health of the patient.

GLOMERULONEPHRITIS

Because many of the toxins which develop in the body as results of human or bacterial metabolism are eliminated through the kidney, it might be expected that if the conception of focal infection had an actual

10. Hench, P. S.: Is Rheumatoid (Atrophic) Arthritis a Disease of Microbic Origin? A Summary of the Arguments For and Against the Infectious Theory, in *A Survey of Chronic Rheumatic Diseases*, London, Oxford University Press, 1938, pp. 35-62.

11. Irons, E. E.: Chronic Arthritis, a General Disease Requiring Individualized Treatments, *Ann. Int. Med.* 9: 1658-1663 (June) 1936.

12. Miller, J. L.: A Critical Review of the Literature on Chronic Rheumatism, *Arch. Int. Med.* 57: 213-234 (Jan.) 1936.

13. Buckley, C. W.: Prognosis in Arthritis, *Lancet* 1: 1023 (May 2), 1081 (May 9) 1936.

14. Cecil, R. L., and Angevine, D. M.: Clinical and Experimental Observations on Focal Infection, with an Analysis of 200 Cases of Rheumatoid Arthritis, *Ann. Int. Med.* 12: 577-584 (Nov.) 1938.

15. Cecil and Archer, quoted by Cecil and Angevine¹⁴.

16. Bierring, W. L.: Focal Infection: Quarter Century Survey, *J. A. M. A.* 111: 1623-1627 (Oct. 29) 1938.

physical counterpart the kidney would be likely to be affected by the supposed toxins produced. No experimental work yet done has provided an explanation for the exact pathogenesis of acute glomerulonephritis as it occurs in man. In the recent work of Schwentker and Comploier,¹⁷ for example, rabbits received emulsions of homologous kidneys alone and in combination with streptococcal toxin. Control animals received toxins alone. In the blood of these rabbits complement fixing antibodies were found which were similar to complement fixing antibodies found in the blood of a majority of patients who had scarlet fever. This work suggests that cytotoxins originate autogenously when the kidney is injured by toxins, but it does not explain why it is that clinically recognizable nephritis develops among some persons while they have scarlet fever, whereas among others it does not.

By "acute glomerulonephritis" is meant acute renal disease in which there is definitely impaired renal function as evidenced by the loss of large amounts of albumin in the urine, retention of nitrogenous products in the blood, bleeding from the parenchyma of the kidneys, severe oliguresis or, in some instances, anuria. It is generally recognized that a patient who has "acute nephritis" may die during an acute attack of the disease, that such a patient's kidneys may become completely healed, or that his condition may eventually develop into chronic glomerulonephritis.

Woods and Binger¹⁸ estimated the etiologic agents in 61 cases of acute glomerulonephritis at the Mayo Clinic. These patients previously had shown no evidence of renal disease. Woods and Binger found that in 84 per cent of the cases the condition had developed during acute inflammation of the upper part of the respiratory tract, including cases in which the diagnosis was acute coryza, acute mastoiditis, acute tonsillitis or acute pharyngitis. Fourteen of the patients in this series had undergone tonsillectomy and 7 had undergone mastoidectomy while the nephritis which they had was in a comparatively active stage. After elimination of the focus of infection a noticeable improvement in the renal disease was noted. It was suggested that elimination of these foci of infection was largely responsible for the favorable and encouraging results in this series of cases, because neither death nor chronic nephritis ensued in any of the 21 cases mentioned in which the acute focus of infection was eliminated.

It is widely accepted that chronic glomerulonephritis is not a progressive disease which starts from one acute attack of nephritis but that it is caused, rather, by repeated or continued toxic assaults on the kidneys which originate in acute or chronic foci of infection. The chronic changes resulting from necrosis of tissues are irreversible and when changes are widespread we are aware that little can be done toward cure of chronic nephritis. Of the patients suffering from chronic nephritis who come to us with intermittent exacerbations of the acute phase, more than 80 per cent have evidences of chronic infections about roots of teeth, in the tonsils or in the sinuses. We feel that the clearing up of such foci as soon as possible not only shortens the convalescent period of the acute episode but, in addition helps to protect the patient from further damage to the kidney.

17. Schwentker, F. F. and Comploier, F. C.: The Production of Kidney Antibodies by Injection of Homologous Kidney Plus Bacterial Toxins, *J. Exper. Med.* 70: 223-230 (Sept. 1) 1939.
18. Woods, R. M., and Binger, M. W.: Unpublished data.

CONCLUSIONS

Assay of the probable importance of focal infection from the clinical standpoint alone as it concerns the three clinical entities of heart disease, chronic infectious arthritis and glomerulonephritis reveals that we progress from tepidity toward relative enthusiasm to whole-hearted acceptance of the conception of focal infection. From the clinical standpoint we find it impossible to distinguish clearly among the acute focus the subacute focus, the chronic focus with acute exacerbation or the true chronic focus, because the transitions between these several states are not sufficiently abrupt. It seems certain that the conception of focal infection is of definite clinical usefulness and that it is unreasonable to expect removal of foci of infection to eliminate the fibrous end result of tissue necrosis. Viewed from this standpoint, such papers as the one of Cecil and Angevine seem to lose much of their force antagonistic to this conception. In a "reevaluation" of the conception of focal infection it would seem the more logical procedure to consider it in relation to a single disease entity rather than to become lost in generalities, and it would seem wise to consider, along with the results secured, the stage of the condition present and the pathologic processes involved.

Results of the study suggest that the type of condition being seen by a given clinician tends to influence his attitude toward the conception of focal infection.

OBSERVATIONS ON THE PROPHYLACTIC USE OF SULFANILAMIDE ON RHEUMATIC PATIENTS

WITH A REPORT OF ONE DEATH

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AND

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With the advent of sulfanilamide therapy it was natural that it should be tried in rheumatic fever. Despite the lack of proof that the hemolytic streptococcus is the etiologic factor in the disease, it has been postulated that the beta hemolytic streptococcus acts as a catalytic agent to start off the rheumatic cycle. It was soon shown by Swift, Moen and Hirst¹ and Massell and Jones,² independently, that not only is sulfanilamide of no value in active rheumatic fever but that it is definitely harmful. In January 1939 two papers appeared on the prophylactic use of the drug in susceptible rheumatic subjects, in one of which Thomas and France reported encouraging results in an adult group of ambulatory patients and in the other Coburn and Moore³ were just as encouraging about a group of children in a convalescent home. With this in view, it was decided to try the drug on ambulatory rheumatic children carrying on their normal activities. The first

From the Children's and Adolescents' Cardiac Clinic of Roosevelt Hospital.

1. Swift, H. F.; Moen, S. K., and Hirst, George: Action of Sulfanilamide in Rheumatic Fever, *J. A. M. A.* 110: 426 (Feb. 5) 1938.

2. Massell, B. F., and Jones, T. D.: Effect of Sulfanilamide on Rheumatic Fever and Chorea, *New England J. Med.* 218: 876 (Mar. 29) 1938.

3. Coburn, A. F., and Moore, L. V.: Prophylactic Use of Sulfanilamide in Streptococcal Respiratory Infections with Special Reference to Rheumatic Fever, *J. Clin. Investigation* 18: 147 (Jan. 1) 1939, *Prophylactic Use of Sulfanilamide in Rheumatic Subjects*, *M. Clin. N. America* 24: 665 (May) 1940.

part of the study was not started until the last of January 1940, owing to lack of technical assistance, and was terminated the end of May.

SELECTION OF PATIENTS

The subjects for the first study were all taken from the Children's and the Adolescents' Cardiac Clinics of Roosevelt Hospital. Every child had had a definite rheumatic attack within the past two years, i. e. polyarthritis, carditis or chorea (chorea had to be accompanied by some other rheumatic stigma before it was accepted as being due to rheumatic fever). Because of the unusual toxicity of sulfanilamide in active rheumatic fever, we excluded any child who we thought was active at the time. In the group used, the average age was 11 years and the average weight 83½ pounds (37.8 Kg.), as opposed to the control group in which average age was 9½ years and average weight 72 pounds (32.7 Kg.). The distribution of sexes in the two groups was the same, being about 50 per cent of each. Each group was made up of 14 children with approximately the same cardiac histories and social status. The only difference between the groups was that the controls lived at some distance from the hospital and were unable to come in regularly for check-ups on the blood and urine.

PROCEDURE

In both groups a preliminary test on the urine, blood count, sedimentation rate determination (Westergren), electrocardiogram and roentgenography or fluoroscopy of the chest were done. Following the dosage used by Drs. Coburn and Moore, we gave 1.5 Gm. of sulfanilamide in three divided doses to the children weighing less than 55 pounds (24.9 Kg.) and 2 Gm. to those weighing more than 55 pounds. Each child was given a printed set of instructions directing him to report any sign of toxicity immediately to the social worker or to the doctor in the accident room. Each child was instructed to report to the laboratory twice a week for the first three weeks for a check-up on the hemoglobin and the white blood cell count and to report weekly thereafter. At every visit the urine was tested for bile. Sedimentation rates were done at least once a month. The control group was not followed so closely.

RESULTS OF FIRST STUDY

Of the 14 children taking the drug, 7 did well and no further comment is needed. There were 2 cases of rash on a dosage of 0.6 Gm. three times a day which disappeared when 0.6 Gm. was given only twice a day. The drug was stopped entirely in 5 cases. In 1 of these a drug rash persisted even after the dosage had been reduced. In another, the rash was so severe in three days that it was deemed foolhardy to continue even on a reduced dosage. There is some uncertainty about 1 of these 5 children because he had a febrile incident in the home and stopped the drug himself. In the remaining 2 cases the drug was stopped because of the reduction of the polymorphonuclear cells; in 1 the cells dropped to 26 per cent on the twenty-first day and the other to 30 per cent at the end of eleven weeks. We decided to stop the drug when the polymorphonuclear count dropped to 30 per cent and were always concerned when it got below 45 per cent. At such times we did daily counts. There were 4 cases in which this occurred.

Of the 14 children in the control group, 7 remained well. Three had respiratory infections necessitating bed

rest but showed no signs of rheumatic activity. Two children had questionable rheumatic activity and 2 had a definite rheumatic flare-up.

The number the first year was small but we wished to gain some knowledge of the difficulties involved in using the drug on ambulatory children before undertaking a larger group.

PROCEDURE OF SECOND STUDY

In the fall of 1940 we started the study again on a larger scale. We decided to use any child or adolescent who had a definite diagnosis of a previous rheumatic episode regardless of when it occurred, as long as the condition was inactive at the time that the drug was started. We feel that any child who has had an attack of rheumatic fever is subject to a recurrence until well past adolescence, at which time the danger is less apparent. To be of any real value, a prophylactic measure of this kind would, of necessity, have to be used yearly until the patient reached the age of 17 or 18 years. For this reason all we required for inclusion in this group was a previous diagnosis of rheumatic fever.

The same method of taking white and red blood cell counts twice a week for three weeks, then once a week thereafter, was used. Sedimentation rates were also determined at the beginning and at least once a month thereafter. Since we had run into no difficulty with the urine the previous year, this test was eliminated.

RESULTS OF SECOND STUDY

Thirty-two patients were started on the drug early in December. The results are summarized here and more detailed histories are given at the end of this article.

Eighteen patients were treated without incident. One boy was readmitted to the ward three weeks after he started taking the drug. However, his condition may not represent a reactivation, since it was active by laboratory tests six weeks before admission to the group, though inactive by the same tests two weeks before admission. His probably was a condition of continued activity rather than a fresh flare-up of an inactive case. Three patients did not cooperate in getting regular blood counts. Nausea developed in another, necessitating stopping of the drug. Rash developed in 3 cases and the drug had to be discontinued, as lowering the dosage did not relieve the symptoms. In 5 cases there was a lowering of the blood count to levels which we considered alarming. In 3 of these 5 it was necessary to stop the drug altogether.

The last patient, a boy aged 12 years, was found to have an enlarged heart, electrocardiographic changes and an elevated sedimentation rate in July 1938. He had chorea in December 1938. On Dec. 27, 1940 he was started on sulfanilamide 0.6 Gm. three times a day. He came regularly for his blood counts and was doing well. His blood count on Jan. 22, 1941 showed a red blood cell count of 4.7 million, a white blood cell count of 5,550, polymorphonuclears 50 per cent, eosinophils 2 per cent, band forms 7 per cent, lymphocytes 43 per cent and mononuclears 3 per cent. On January 25 a sore throat and an elevation of temperature developed. He did not come to the hospital, as advised, but stopped the drug and saw his local physician, who treated him symptomatically for one day. The following day he received 0.6 Gm. of sulfanilamide and the next day was admitted to the hospital, having had 0.3 Gm. before he came. When he arrived at the hospital sixty hours after the onset of symptoms he had exudate with a

few ulcers on his throat and a temperature of 105 F. The blood count showed normal red cells and 300 white cells, with only 1 per cent polymorphonuclears. The sulfanilamide level was 1.86 mg. per hundred cubic centimeters. Blood culture showed hemolytic *Staphylococcus aureus* and three days later hemolytic *Staph. aureus* and pneumococcus type III, at which time the sulfanilamide level was 1 mg. per hundred cubic centimeters. His course was steadily downhill; the temperature never went below 105 F. At no time did he have more than 1 per cent polymorphonuclears. He died on the fourth day despite transfusions twice a day, pentnucleotide, yellow bone marrow extract and liver extract. For the hemolytic *Staph. aureus* he received bacteriophage. As a last effort he was given intravenous sodium sulfathiazole three hours before death. The cause of death was acute agranulocytosis with secondary infection of the blood stream with hemolytic *Staph. aureus* and pneumococcus type III. Unfortunately permission for an autopsy or bone marrow study was not granted.

COMMENT

Since the beginning of the study we had been concerned with the possibility of sulfanilamide toxicity if given over a long period of time, even in small doses. We had hoped to avoid any toxicity by careful observation of the patients and frequent laboratory check-ups of the blood. We selected only children whose parents we felt would cooperate with us in seeing to it that the patients reported regularly. Despite this, we found that the human equation militated against us and that in some cases from one to two weeks would go by before a child would report for blood counts or for clinic appointments. Also, when unforeseen conditions arose the parents would not consult us but would use their own judgment as to how to treat the situation. The most efficient and sympathetic aid was given by the social worker and the laboratory technician.

With these precautions, in the first year one half of the patients had to give up using the drug because of some toxic reaction. In the second year, when the drug had been used but two months, 9 patients out of 32 had to discontinue using it, and 1 death occurred which was attributable to the sulfanilamide. After the death we had many consultations as to whether or not the study should be continued and finally decided to stop the use of the drug prophylactically in our clinic.

We feel that the drug should not be used as a prophylactic for the ambulatory rheumatic patient because in our experience, while subject to rigid precautions, it failed. We do not feel that a simple reduction in the dosage is the answer, although the toxicity of the drug was diminished considerably thereby. We feel that no large group of children can take the drug in any dosage over the necessary eight to ten winters without some mortality from its use.

CONCLUSIONS

1. Sulfanilamide can be a lethal drug when used prophylactically on the rheumatic patient.
2. At the present state of knowledge the drug should not be used in ambulatory rheumatic children and adolescents.

BRIEF SUMMARIES OF CASES IN WHICH SOME DIFFICULTY WAS ENCOUNTERED

In cases 1, 2 and 3 the only difficulty was lack of cooperation in obtaining blood counts regularly.

A boy aged 7 years (case 4) was nauseated two days after taking the drug. He refused to continue even

on a reduced dosage. He had no change in the blood count.

Patient 5 had a rash at the end of thirty days on a dosage of 0.6 Gm. three times a day. The drug was stopped for five days with disappearance of the rash. Then she was started on 0.3 Gm. three times a day. She stopped the drug five days later because of headaches.

Patient 6, after one month on 0.6 Gm. twice a day, had swelling of the face and a drop in polymorphonuclears to 35 per cent. The next day the polymorphonuclears were 44 per cent, so the drug was continued. The day after that, he had a chill and the swelling of the face persisted, with polymorphonuclears of 50 per cent. Despite vagueness of symptoms, the drug was stopped and the swelling disappeared.

Patient 7 was taking 0.6 Gm. three times a day. A severe headache developed after the first dose, and after the second dose her teacher said that she was feverish, restless and had no appetite. The next day she took one more dose and in a short while had a recurrence of the severe headache and a punctate rash on the abdomen, so the drug was discontinued.

In case 8 on 0.6 Gm. twice a day, the polymorphonuclear cells dropped to 32 per cent the day after it was started. The drug was stopped for two days and the polymorphonuclears returned to 46 per cent. The drug was then given in doses of 0.3 Gm. three times a day. There was no further difficulty on this dosage.

Patient 9 took 0.6 Gm. three times a day. The polymorphonuclears fell to 28 per cent in five days. The next day, without change in the dosage, the polymorphonuclears rose to 56 per cent, but we reduced her dose to 0.3 Gm. three times a day. Two weeks later the polymorphonuclears were 45 per cent, at which time the study was terminated.

Patient 10 at the end of eight days had a generalized erythematous rash which disappeared twenty-four hours after the drug was stopped. He was then put on 0.3 Gm. twice a day and had no further rash, but two days later the polymorphonuclear cells fell to 37 per cent, and the next day the polymorphonuclear cells dropped to 31 per cent even though the drug had been stopped. Two days later they were still 31 per cent, although the total white cell count had risen from 4,100 to 6,700 cells.

Patient 11 on a dosage of 0.6 Gm. three times a day had polymorphonuclear counts fluctuating between 53 per cent and 38 per cent, necessitating frequent counts. The dosage was cut in half and the count was 37 per cent after six days, at which time the study was ended.

Patient 12 had a fall in polymorphonuclears to 35 per cent in ten days, but without stopping the drug he had a return to normal and continued without incident to the end of the period.

A girl aged 15 (case 13), weighing 115 pounds (52.1 Kg.), had taken the drug the previous year. At that time her polymorphonuclear cells fell abruptly to 30 per cent at the end of three months. This year, on a reduced dosage of 0.3 Gm. twice a day, she broke out after seven days in an urticarial rash on the hands and feet. There were no changes in the blood count. However, the drug was stopped. This case is particularly interesting because it may indicate a change of sensitivity to the drug.

565 Park Avenue.

Clinical Notes, Suggestions and New Instruments

THROMBOSIS OF THE INFERIOR VENA CAVA FOLLOWING PHYSICAL EXERTION

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During the past year we have had the opportunity to observe a case of obstruction of the inferior vena cava from shortly after the onset of the condition to the establishment of an apparently adequate collateral circulation. Because of the rarity of the condition and the unusual etiology, the case seems worth reporting.

REPORT OF CASE

A white girl aged 20, a physical education student, consulted the University of Wisconsin Health Service on Nov. 6, 1940 because of edema of the legs and enlarging abdominal veins. She had been well until July 29, 1940, when while "tumbling" she did a "back flip." At this time she felt "something pull" in the lower part of the back. There was little discomfort, however, until two days later, at which time there was aching in the small of the back, particularly when she was in the recumbent position, which was somewhat relieved by flexion of the thighs. The following day (August 1) the pain was present with walking or with straightening of the back, and the discomfort gradually became so severe that medical attention was necessary. A physician taped the lumbar region, but this seemed to aggravate the condition. On August 3 there was cramplike pain in the thighs, particularly the left, and general malaise associated with a slight febrile reaction. The symptoms became so severe that bed rest was necessary for the next three weeks. During this period the temperature rose to 102 F. The anterior aspect of the thighs became blue and somewhat edematous, the left more so than the right. There were repeated cramps in the legs which were associated with a temporary increase in the discoloration and were partially relieved by massage. When she attempted to stand, both the legs and thighs became swollen and blue, but elevation of the legs relieved this. At the end of three weeks the discomfort and fever had subsided and the patient was allowed out of bed. The legs then became hard and edematous, reaching what was considered to be two or three times their normal size. The edema was greatly relieved after a period of bed rest. On September 30 the patient was allowed to return to school. She then discovered for the first time that the veins of the right side of the abdomen were becoming large.

The past medical history was positive for measles, whooping cough and scarlet fever in early childhood. There had been repeated colds and sore throats. In 1937 an apical systolic murmur had been heard. On July 11, 1940 diseased tonsils had been removed and on July 25 a submucous resection was performed. Normal convalescence followed both surgical procedures.

On physical examination, November 6, the patient was well developed and well nourished and appeared to be in excellent health. There were no gross abnormalities of the eyes, ears, nose or throat. Fundoscopic examination gave negative results. There was a soft systolic murmur heard along the left sternal border and at the apex, present in all positions, but it practically disappeared with deep inspiration. The blood pressure was 124 systolic and 74 diastolic. Inspection revealed obvious enlargement of the superficial veins over the lower part of the chest, abdomen and upper part of the thighs, particularly on the right side. Over the lower half of the abdomen the venous blood flow was from below upward. The liver and spleen were not enlarged and ascites was not present. There was extensive edema of the legs and thighs with a bluish mottling, particularly on the left side, but the patient stated that there was much less edema than there had been a few weeks before.

From November 19 to December 4 the patient was in bed with mumps. During this period the edema was less pronounced and the superficial veins were less evident.

The patient has been observed periodically since. There has been a gradual decrease in the edema of the legs, but the abdominal veins have remained prominent. In February 1941 she was allowed to resume slowly the activities required of a physical education student. By June she was swimming, playing lacrosse and tennis and doing some modern dancing. The legs and ankles returned to their normal size and the edema would become evident only after a day of considerable physical exertion.

COMMENT

The diagnosis in this case was obstruction of the inferior vena cava, partial or complete. Extensive studies were made in December 1940 while the edema was still evident and again in June after the collateral circulation had apparently compensated for the obstruction. Blood studies including hemoglobin content, red and white blood cell counts, differential counts, serologic examination, determination of the blood sugar, nonprotein nitrogen, platelets, bleeding and coagulation time, chlorides, cholesterol, sedimentation rate, serum proteins and

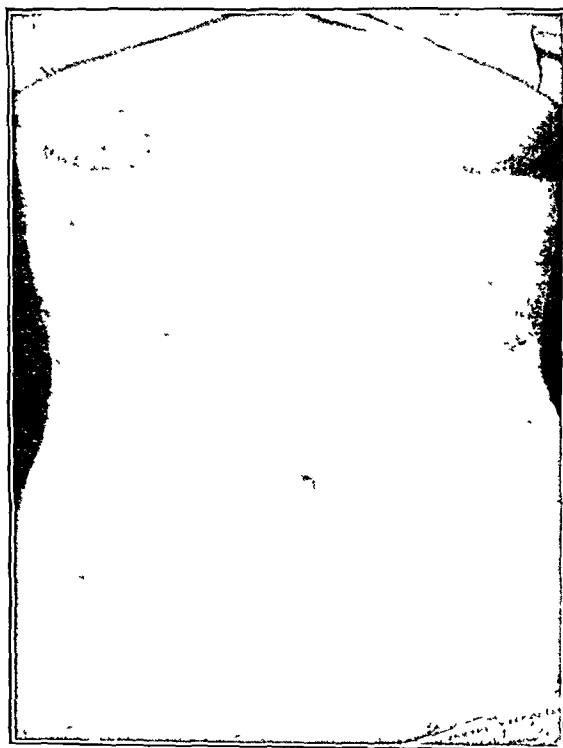


Fig. 1.—Appearance of abdominal veins on Dec. 17, 1940.

the albumin/globulin ratio were within normal limits. Routine examinations of the urine were negative. Further renal studies, including dilution concentration tests, phenolsulfonphthalein and the urea clearance, were within the normal range. In December 1940 the cephalin-cholesterol test was 2 plus, suggesting slight impairment of liver function, although the galactose tolerance test was within normal limits and the plasma prothrombin time was 100 per cent.

Numerous roentgenograms of the spine and abdomen were made. The vertebrae were normal in position and there was no evidence of a tumor. Although careful neurologic studies gave repeatedly negative results, a spinal puncture was done in December. The spinal fluid was normal in every detail. In June 1941 roentgenograms of the abdomen were made to determine whether calcification of the vena cava had occurred, as has been reported in similar cases, but none was found.¹

Since Castellanos² has stressed the importance of visualization of the inferior vena cava for location of tumor masses, in

1. Keen, J. A.: A Case of Complete Obstruction of the Inferior Vena Cava, *Brit. M. J.* 2: 823-825 (Dec. 14) 1940.

2. Castellanos, Agustín, and Pereiras, Raul: La caviografía inferior; Comunicación preliminar, *Arch. de med. int.* 4: 362, 1938

June 1941 diodrast was injected into the distal portion of the great saphenous vein of the right foot. This showed the right common iliac vein well outlined. The shadow of this vein was traced to the level of the disk between the third and fourth lumbar vertebrae, above which it gradually faded. Some of the communicating veins lateral to the lumbar spine filled with diodrast so that dilated and tortuous collateral veins were visualized overlying the right side of the sacrum. Therefore, though this examination did not demonstrate definitely a complete block in the inferior vena cava, it showed a well developed collateral circulation. Roentgenograms of the chest and of the kidneys, including pyelograms, were all negative.

More detailed studies were made of the cardiovascular system. An orthodiagram in January 1941 showed the great vessels to be normal. The heart was within normal limits as to size and shape except for a slight dilatation of the left auricle posteriorly and to the right. Because of the murmur and the characteristic orthodiagram, it was felt that a mitral lesion existed. It is probable that this lesion had been present previously, since a systolic murmur had been noted in 1937. Ortho-

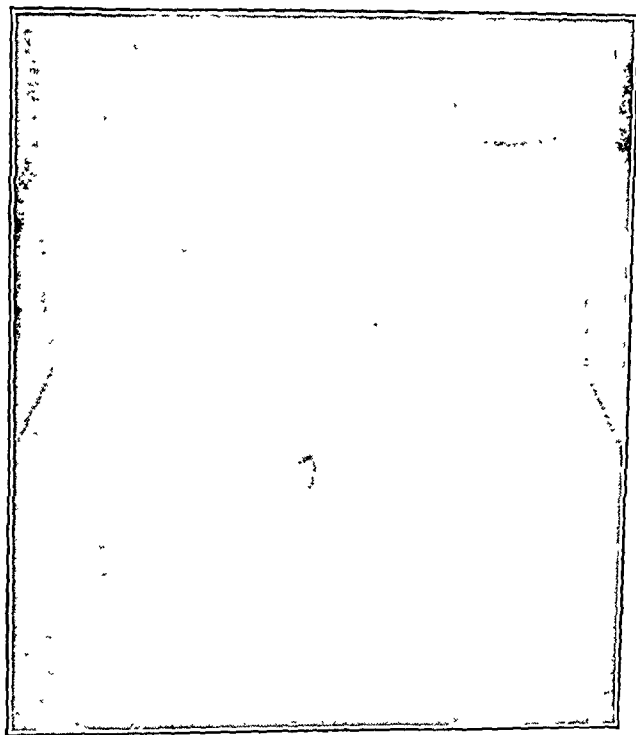


Fig. 2.—Appearance of abdominal veins on June 11, 1941.

diacoscopy was repeated in June and showed no change. In January 1941 the electrocardiogram showed slight elevation of the ST segments in all four leads which had practically disappeared in May 1941. One month later the ST segments had again become elevated. In February 1941 venous pressures determined by the direct method were 17 cm. of water in the antecubital vein and 21 cm. of water in the ankle vein. In June determinations by the indirect method as described by Eyster³ were 7 cm. of water in the wrist vein and 21 cm. of water in the ankle vein. Also on this date the circulation time was studied by the use of 10 per cent calcium gluconate. The circulation time from the antecubital vein to the tongue was seven seconds and from the ankle vein to the tongue was ten seconds. The circulation time from the antecubital vein to the lung by the ether method was four seconds.

COMMENT

In a review of 314 cases of obstruction of the inferior vena cava Pleasants⁴ has classified them according to their etiology as follows: obstruction due to (1) thrombosis primarily, (2)

new growths within the inferior vena cava, (3) nonmalignant disease of the abdomen, (4) new growths outside the vena cava, (5) kinking of the inferior vena cava, (6) congenital obliteration and (7) ligation. One hundred and seventy-one fell into the first group, and of these 41 were due to specific infectious diseases, 8 were a complication of chlorosis, 45 followed puerperal sepsis, 17 were due to local inflammatory foci, 18 were from direct trauma, 2 resulted from injury associated with overexertion and 40 were of unknown etiology.

We believe that the obstruction in this case was due to thrombophlebitis following overexertion. Several points in the history are of interest and are fairly significant. There was a history of recent surgery to the nose and throat at which time badly diseased tonsils were removed. Ochsner and DeBakey⁵ emphasize that "trauma whether operative or non-operative predisposes to thrombophlebitis either directly as a result of injury to vessels or indirectly as a result of injurious substances derived from destroyed tissue." Also there is a remote possibility that a temporary bacteremia followed tonsillectomy with injury to the vascular system. The history of additional trauma due to overexertion is fairly definite. It was during a "back flip" that our patient felt something give way in her back, and all her symptoms dated from that episode. Though such an etiology is doubtless rare, there are several cases in the literature presenting somewhat comparable histories. Pleasants⁴ mentioned 2 cases, 1 in which thrombosis followed a forced march and another in which there was "overexertion followed by severe lumbar pain and symptoms of obstruction." Shattock⁶ described the condition in a medical student aged 24 who had severe lumbar pain after running a race. This was followed by edema of the legs and enlargement of the superficial veins. An autopsy on this patient twenty-five years later showed occlusion of the inferior vena cava extending from below the portal vein to the renal veins. In our case it seems reasonable to suppose that the sudden strain from strenuous physical exertion caused an injury to the wall of a vessel which may have been weakened as a result of recent surgery.

The clinical course was typical of a gradually developing caval obstruction. The first complaint was severe lumbar pain, which was later associated with fever, both symptoms probably being due to thrombophlebitis. This was followed by massive edema of the legs and thighs, which slowly disappeared as the collateral circulation developed.

For a detailed description of the collateral circulation in obstruction of the inferior vena cava, the reader is referred to Pleasants' monograph.⁴ Our patient was not seen until her acute symptoms had subsided, so all studies on her must be considered from that standpoint. If these could have been made during the acute phase they would have been more significant. However, in view of the edema described, the extensive collateral circulation and some evidence of possible hepatic involvement three months after the onset of the illness, it is probable that the obstruction occurred in the upper third of the vena cava.

Bay, Gordon and Adams⁷ have reported electrocardiographic changes with experimental occlusion of the vena cava in dogs. They found deviation of the ST segment which persisted with the obstruction. It is interesting to note that in the case here reported, ST segment deviation constituted the only abnormal electrocardiographic condition.

The prognosis of inferior caval obstruction is good if the underlying pathologic condition is not progressive and the obstruction is slow enough to permit an opportunity for development of an adequate collateral circulation. There are reports in which a patient has survived for as long as forty years. We feel that our patient will be able to teach physical education as she had planned and that she should be perfectly well so long as she keeps her physical activities within reasonable limits.

5. Ochsner, Alton, and DeBakey, M. E.: *Thrombophlebitis and Phlebotomy*, South Surgeon 8: 269 (Aug.) 1939.

6. Shattock, S. G.: *Occlusion of the Inferior Vena Cava as a Result of Internal Trauma (Dissecting Varix): The Case of the Late W. F. Pollock*, Brit. M. J. 1: 385 (Feb. 22) 1913.

7. Bay, E. B., Gordon, Wayne, and Adams, Wright: *Electrocardiographic and Blood Pressure Changes in Experimental Pericardial Effusion and Occlusion of Venae Cavae*, Am. Heart J. 8: 525 (April) 1933.

3. Eyster, J. A. E.: *The Clinical Aspects of Venous Pressure*, New York, Macmillan Company, 1929.

4. Pleasants, J. H.: *Obstruction of the Inferior Vena Cava with a Report of Eighteen Cases*, Johns Hopkins Hosp. Rep. 16: 363, 1911.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT
HOWARD A. CARTER, Secretary

RADIOEAR MASTERPIECE ACCEPTABLE

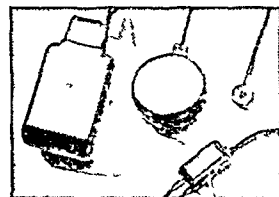
Manufacturer E A Myers and Sons, 306 Beverly Road, Mount Lebanon, Pittsburgh

The Radioear Masterpiece, a carbon microphone aid, was examined by the Council and was found to consist of the following parts

Microphone number M 1665
Intensifier A 1434
Battery case
Miniature crystal receiver R 2576
Molded earpiece
Bone conduction oscillator B 1304

The microphone is disk shaped, $2\frac{1}{2}$ inches in diameter, $\frac{5}{16}$ inch thick, weighing approximately 2 ounces, fitted with spring clip for attaching to clothing. The battery case and intensifier are

of molded bakelite. The battery case carries two 1.5 volt cells, size C, number 935, for air conduction, or three similar cells for bone conduction. With two cells the weight is approximately $6\frac{1}{2}$ ounces and with three cells approximately 7 ounces. The earpiece is of molded bakelite, to be fitted into the ear cavity. The receiver is of the miniature magnetic type,



Radioear Masterpiece

$\frac{5}{16}$ inch in diameter and $\frac{5}{16}$ inch thick. Receiver and earpiece together weigh approximately 0.4 ounce. The bone conduction oscillator is rectangular, $1\frac{1}{2}$ by $\frac{3}{4}$ by $\frac{5}{8}$ inch, weighing approximately 0.8 ounce. All parts are mechanically well constructed. The fact that ordinary commercial dry cells can be used and are easily replaceable is a distinctly advantageous feature.

Battery Consumption—With the two cell battery of 3 volts for air conduction the currents drawn are as follows

Control barely on	25 milliamperes
Control half on	30 milliamperes
Control fully on	40-50 milliamperes

With the three cells, 4.5 volts for bone conduction,

Control barely on	35-40 milliamperes
Control fully on	70-75 milliamperes

Internal Noise—Direct comparison of the internal noise with the noise from an audiometer of the buzzer type indicates that the noise level is of the order of 20 to 25 decibels above the normal ear threshold. This would not be a disturbing element in cases of deafness in which the threshold of hearing is below normal by this amount. There is no "feed back" noise in the instrument under conditions of use.

Amplification—Using two deaf subjects, the amplifications at discrete frequencies from 128 to 4,096 cycles were measured audiometrically. The receiver of a Western Electric 2-B audiometer was set in a capsule of sponge rubber and the threshold of the subject was measured with the receiver thus enclosed held to the ear. The thresholds were again determined with the transmitter of the hearing aid laid on the sponge rubber capsule and the earpiece inserted in the ear of the subject. The differences between the two thresholds were taken as the gain in decibels afforded by the aid. Results obtained by the two observers in repeated tests were fairly consistent. The average gains in decibels shown with the air conduction receiver were as follows:

Frequency	128	256	512	1024	2048	4096
Gain	8	7	16	13	8	none

Articulation Tests—The instrument was found to give satisfactory results in these tests.

The Council voted to accept the Radioear Masterpiece for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary

THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1941, p. 551)

The following dosage forms have been accepted

Tablets *Thiamine Hydrochloride Endo*, 1 mg, 3 mg, 5 mg
Prepared by Endo Products, Inc., Richmond Hill, N. Y.
Solution *Thiamine Hydrochloride Endo*, 1 mg per cc, 6 mg per cc, 10 mg per cc, 15 mg per cc, and 30 mg per cc in 1 cc *Ampuls*.
Each cubic centimeter of solution contains 10 mg of benzyl alcohol in sterile distilled water.
Prepared by Endo Products, Inc., Richmond Hill, N. Y.
Solution *Thiamine Hydrochloride Endo*, 10 mg per cc, in 10, 25, and 50 cc vials, 30 mg per cc in 10, 25, and 50 cc vials, 50 mg per cc in 5, 10, and 25 cc vials. Each cubic centimeter of solution contains 10 mg of benzyl alcohol in sterile distilled water.
Prepared by Endo Products, Inc., Richmond Hill, N. Y.

NICOTINIC ACID (See New and Nonofficial Remedies, 1941, p. 555)

The following dosage forms have been accepted

Tablets *Nicotinic Acid*, 25 mg
Prepared by the International Vitamin Corp., New York.
Tablets *Nicotinic Acid*, 50 mg
Prepared by the International Vitamin Corp., New York.
Tablets *Nicotinic Acid*, 100 mg
Prepared by the International Vitamin Corp., New York.

SUSPENSION OF EPINEPHRINE IN OIL, 1:500-N. N. R. (See New and Nonofficial Remedies, 1941, p. 255)

Epinephrine in Oil, 1:500-Smith-Dorsey—A brand of suspension of epinephrine in oil 1:500-N. N. R.

Manufactured by The Smith-Dorsey Co., Lincoln, Neb. No U. S. patent or trademark.
Ampuls *Epinephrine in Oil 1:500-Smith-Dorsey*, 1 cc. A suspension of 2 mg powdered epinephrine crystals in 1 cc of peanut oil.

EPHEDRINE SULFATE (See New and Nonofficial Remedies, 1941, p. 247)

The following dosage forms have been accepted:

Ampoules *Ephedrine Sulfate Solution Endo*, 0.05 Gm ($\frac{3}{4}$ gr.), 1 cc.
Prepared by Endo Products, Inc., Richmond Hill, N. Y. No U. S. patent or trademark.
Tablets *Ephedrine Sulfate Endo*, $\frac{3}{4}$ grain.
Prepared by Endo Products, Inc., Richmond Hill, N. Y. No U. S. patent or trademark.

CYCLOPROPANE (See THE JOURNAL, May 31, 1941, p. 2505, and the Supplement to New and Nonofficial Remedies, 1941, p. 5)

CYCLOPROPANE (OHIO CHEMICAL & MFG CO)—A brand of cyclopropane-U. S. P.

Manufactured by Ohio Chemical and Manufacturing Co., Cleveland. No U. S. patent or trademark.

SODIUM MORRHUATE (See New and Nonofficial Remedies, 1941, p. 501)

The following dosage form has been accepted.

Vial *Sodium Morrhuate 5% and Benzyl Alcohol 2%*, 5 cc. Each cubic centimeter contains 0.05 Gm of sodium morrhuate and 0.02 Gm of benzyl alcohol in aqueous solution.
Prepared by The Lakeside Laboratories, Inc., Milwaukee.

CAFFEINE WITH SODIUM BENZOATE (See New and Nonofficial Remedies, 1941, p. 173).

Hint, Eaton & Co., Decatur, Ill.

Ampuls *Solution Caffeine with Sodium Benzoate*, 2 cc. An aqueous solution containing in each 2 cc of caffeine with sodium benzoate, U. S. P., 0.5 Gm ($7\frac{1}{2}$ grains).

TETANUS TOXOID, ALUM PRECIPITATED (See New and Nonofficial Remedies, 1941, p. 470).

Parke, Davis & Company, Detroit

Tetanus Toxoid, Alum Precipitated (Refined)—Marketed in packages of two 1 cc vials (one immunization treatment) and in packages of one 10 cc vial (five immunization treatments).

THEOPHYLLINE WITH ETHYLENEDIAMINE (See New and Nonofficial Remedies, 1941, p. 583).

The following dosage form has been accepted

Ampule *Solution Aminophylline*, 20 cc, 0.48 Gm ($7\frac{1}{2}$ grains).
Prepared by The Lakeside Laboratories, Inc., Milwaukee.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 20, 1941

EMERGENCY MEDICAL SERVICE FOR CIVILIAN DEFENSE

Under the section on Medical Preparedness in this issue of *THE JOURNAL* appears a special announcement from the Office of Civilian Defense on the relationship of emergency medical service to control centers. Last week the Council on Medical Education and Hospitals of the American Medical Association mailed to all hospitals reprints of two bulletins which have been issued by the Medical Division of the Office of Civilian Defense. These were published in *THE JOURNAL* under the heading of Medical Preparedness on August 30 and November 22. Those hospitals which have not received the bulletins should communicate at once with the Office of Civilian Defense. The outlines supplied, together with the information which appears in our current issue, give all the information needed for complete cooperation.

The significant steps include the following:

1. State and local authorities who have not done so should at once appoint state and local chiefs of emergency medical service in consultation with state medical societies.

2. State defense councils should instruct local chiefs of emergency medical service to complete a spot map which will show

- (a) Localization of all hospitals.

- (b) The number of emergency medical squads available

- (c) Sites for casualty stations in each section of the city.

3. Inventories should be made of bed capacity of hospitals inside and outside of cities, and the amount of expansion possible during an emergency determined.

4. Arrangements for transportation should be organized immediately in each district under control of the local civilian defense commander.

5. Staffs of hospitals and agencies for transportation should have a drill each week to perfect themselves for action in time of emergency.

Medical facilities from which the civilian defense organization in each state is being

developed are at the local level. In each community, therefore, the local chief of emergency medical service may set up medical advisory councils. He will, of course, utilize the local health department, experienced hospital administrators, representatives of the local medical society and the nursing organizations, and the American National Red Cross and other voluntary agencies. The full responsibility must rest with the local chief of emergency medical service and with his medical advisory council. All agencies must cooperate with this central organization. Attempts to delegate this responsibility or to divide it can result only in confusion and ultimately in disaster.

The medical profession may be relied on to accept the responsibility in this work, as in all other aspects of medicine, in relationship to the emergency. Obviously selection of physicians for work in the civilian defense agency should be left largely to men above the age of 45, since younger men will be required for the active needs of the military and naval services.

SPECIAL DIETARY FOODS AND THE LAW

Mr. Paul V. McNutt, Administrator of the Federal Security Agency, has recently promulgated regulations¹ governing the labeling of foods intended for special dietary purposes. The scope of these regulations is extraordinarily broad, apparently encompassing all foods and dietary supplements for which special claims are made or implied relating to health and disease. Included are vitamin and mineral preparations, staple foods fortified or supplemented with vitamins and other dietary elements, foods employed for infant feeding and foods offered as supplements in the management of obesity, malnutrition, food allergies, convalescence, pregnancy, anemias, lactation and disease. However, preparations administered in potent form solely as drugs for the treatment of disease are not subject to these regulations. For instance, addition of thiamine hydrochloride to a cereal will bring the cereal within the scope of the regulations, whereas a capsule containing 10 mg. of the same substance intended for use on a physician's prescription for the treatment of beriberi will presumably be considered a drug and not a food for "special dietary use."

Basically, the purpose of these regulations is to make available to the purchaser the fullest information concerning the vitamin, mineral and other special dietary properties of the article offered. Some method had to be found for expressing vitamin content, as well as the presence of other ingredients, in terms which would be readily understood by the ordinary purchaser. The

¹ Food, Drug and Cosmetic Act, Regulations under Section 403(j), Federal Register, Nov. 22, 1941.

Food and Drug Administration chose the minimum daily requirement as the basis for labeling. Foods to which these regulations apply are therefore required to state on the label the proportion of the minimum daily requirements furnished by a given amount. During the hearings on these regulations, discussion developed as to whether or not the optimum daily requirement should serve as the basis for the statements on the label instead of the minimum daily requirement. As the hearings progressed the impossibility of obtaining a convergence of expert opinion on what constituted an optimum daily requirement became apparent, whereas reasonable agreement was revealed among prominent students of nutrition on the range of values that could be related to the minimum daily requirements of the minerals and most of the vitamins. Unfortunately, the evidence adduced at the hearing was inadequate to permit the administrator to set a figure for nicotinic acid and some of the more recently isolated vitamins.

The public should know the nutritional properties of the food it purchases. When these regulations become effective, this information will be provided for the first time in terms than can be understood. The statement on a label that an article contains 1 mg. of riboflavin means little to the average purchaser; but when the label states, as it will under the new regulations, that a specified quantity of cereal X contains one half the minimum adult daily requirement of riboflavin the purchaser knows at least that additional riboflavin is needed. The Food and Drug Administration is to be commended for a job well done.

THE KENNY METHOD OF TREATMENT IN THE ACUTE PERIPHERAL MANI- FESTATIONS OF INFANTILE PARALYSIS

At the scientific meeting of the National Foundation for Infantile Paralysis held in New York early in December, consideration was given to reports on the Kenny method of prevention and treatment of the affected muscles. After the Committee on Research for the Prevention and Treatment of After-Effects had heard the reports from various experimental laboratories and clinics on their investigation of the subject, the committee adopted the following statement:

The National Foundation for Infantile Paralysis has supported studies of the Kenny technic under the auspices of the Medical School of the University of Minnesota and specifically under the direction of the Department of Orthopedic Surgery. The Minneapolis General Hospital was chosen for these studies, as beds were available and the necessary supervision was possible by members of the orthopedic staff and the Physical Therapy Department of the University of Minnesota.

The University Hospital rearranged one section of its building for the work, and the necessary equipment was installed. Since June 1941 work on the Kenny treatment of infantile paralysis during the early stage has been going on at both the University Hospital and the Minneapolis General Hospital under the per-

sonal supervision of Miss Kenny and her assistants trained in Australia. Most of the physical therapists of the Twin Cities and many from elsewhere have been working with Miss Kenny and acquiring a knowledge of her methods. The course for physical therapy technicians which has been started at the University of Minnesota includes training in the Kenny method.

The director of the Physical Therapy Department at the University Hospital and the Minneapolis General Hospital, aided by funds of the National Foundation for Infantile Paralysis, is making a detailed study of the method so that he and others may be able to continue with the teaching after Miss Kenny and her staff return to Australia.

It should be emphasized that patients under this treatment have been limited, with few exceptions, to those in the early or acute stage of the disease.

Since June of 1941 about 50 patients in the early stage of infantile paralysis have been treated in the Minneapolis General and the University Hospitals by Miss Kenny and her associates. The care of an almost equal number of patients in other hospitals has been supervised by her, but the actual treatment was carried out by the physical therapists in those institutions.

It is the opinion of this Committee on Research for the Prevention and Treatment of After-Effects of the National Foundation for Infantile Paralysis, after a study of the report of the workers at the University of Minnesota, that during the early stage of infantile paralysis the length of time during which pain, tenderness and spasm are present is greatly reduced and contractures caused by muscle shortening during this period are prevented by the Kenny method. The general physical condition of the patients receiving this treatment seems to be better than that of patients treated by some of the other methods during a comparable period.

It appeared to the Committee on Education and to the Committee on Epidemics and Public Health that the recognition of this method had many implications, particularly since it seemed likely that an outbreak of any considerable size during the spring and summer of 1942 would create a large demand for nurses and physical therapy technicians capable of administering the treatment. These committees therefore adopted the following report:

"It is the opinion of this Committee on Research for the Prevention and Treatment of After-Effects of the National Foundation for Infantile Paralysis, after a study of the report of the workers at the University of Minnesota, that during the early stage of infantile paralysis the length of time during which pain, tenderness and spasm are present is greatly reduced and contractures caused by muscle shortening during this period are prevented by the Kenny method. The general physical condition of the patients receiving this treatment seems to be better than that of patients treated by some of the other methods during a comparable period."

The Committee on Epidemics and Public Health and the Committee on Education of the National Foundation for Infantile Paralysis are aware of the implications of this statement as it relates to the application of the Kenny method in the early stage of infantile paralysis.

Health officers and physicians, including especially pediatricians, now have the intensified responsibility of early recognition of cases of infantile paralysis and the prompt application of appropriate nursing technics and physical methods to these patients.

During the past year the Kenny method has been observed with the aid of the National Foundation in several well recognized medical institutions. For best results this method involves care and the use of special skills under qualified medical supervision.

The Committee on Epidemics and Public Health and the Committee on Education recommend to the National Foundation for Infantile Paralysis that public health officials throughout

the nation be given as promptly as possible information which may be available regarding the nature of the Kenny technic and its integration with other measures of treatment, and the personnel available for its application in outbreaks of infantile paralysis.

The committees recommend furthermore that the training program of the National Foundation for Infantile Paralysis be expanded to provide additional training for considerable numbers of nurses and physical therapy technicians, and recommend expansion of the training program so as to make available additional personnel fully trained in the essentials and principles of the Kenny method.

The committees recommend furthermore that the Committee on Medical Publications of the National Foundation for Infantile Paralysis consider immediately the development of a concise manual providing the essential principles and details of the Kenny method and of other applications of hydrotherapy and physical treatment in the early stage of infantile paralysis.

The committees recommend that state health departments, health officials in larger communities, and other official agencies concerned with the care of infantile paralysis also develop a program to train personnel in the application of the Kenny technic in conjunction with other early treatment of infantile paralysis.

No doubt the National Foundation for Infantile Paralysis will make available in the near future the condensed manual of the technic referred to in these statements and also other information relative to the method so that it may be applied under the direction of competent physicians and specialists in orthopedic surgery as indicated in the individual case. It would, of course, be unfortunate if there should be any attempt to treat patients with infantile paralysis routinely without recognition of the fact that both the severity of the infection and the extent of the paralysis differ in each instance of the disease. Meanwhile the American people and the medical profession are fortunate in having an organization like that of the National Foundation for Infantile Paralysis capable of supporting controlled studies on every aspect of this serious disease and willing, through its board of trustees, to recognize the importance of consulting authoritative scientific information not only in the selection of projects for research but also in extending the results of such research to the patients who need them most. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION has already pointed out that adoption of the Kenny technic represents an elaboration of well recognized principles in the treatment of acute paralysis and also the basis in scientific research on the physiology of the nervous system which explains the value of the technic as practiced. If there is any revolutionary element in the Kenny technic, it consists in its abandonment of early rigid splinting and the adoption of continuous and meticulous hydrotherapy and physical therapy to maintain the function of muscles which still have nerve supply at the highest possible point, at the same time producing increased comfort for the patient. No doubt the period which will elapse before the coming of infantile paralysis next year will give opportunity to

those persons in the medical profession most concerned to prepare themselves to meet the situation with all the new knowledge that the research supported by the National Foundation for Infantile Paralysis has yielded.

SANITATION OF SCHOOL LUNCHES

Increasing interest in hot lunches for school children has been stimulated by a gradual growth of interest in nutrition among children during the past two or three decades. More recently surplus commodities are being diverted to use in schools, and WPA lunch projects have been organized in several communities. The nationwide concentration on nutrition as a part of the defense effort will inevitably bring even more activity in the schools with relation to lunches.

The school lunch is especially valuable to children who live too far from school to go home for lunch or who for other reasons are compelled to carry lunches to school, and also for all others whose diet at home leaves something to be desired. At the same time the school lunch carries with it definite sanitary hazards which need to be considered and circumvented if the school lunch is to be beneficial and without danger to the health of the children.

Recognizing these facts, the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association at its last meeting authorized the preparation of a statement¹ covering sanitary requirements for school lunches. This statement is now available in mimeographed form. Single copies are provided gratis when requested on school or health department stationery. Quantities can be supplied at nominal prices, which will be quoted. Requests should be addressed to the Bureau of Health Education, American Medical Association, Chicago.

The report outlines briefly the requirements for cleanliness of the lunchroom, kitchen, utensils and dress of attendants and emphasizes personal cleanliness for attendants. There is an outline of necessary equipment for preparing food, for storing it if necessary and for proper dish washing. Pasteurized milk, or boiled milk if pasteurized milk is not available, is specified. Keeping of left-overs for use the next day is condemned and the use of day-old products, unless they contain no ingredient susceptible of spoilage or fermentation, is also interdicted. Special warnings are given with relation to products containing "cream fillings, meringues or nonacid dressings or sauces, such as mayonnaise, whipped cream and French dressings." Emphasis is placed on daily supervision by a responsible person trained for such work. Health examinations and appropriate training of personnel are specified as essentials.

¹ Sanitary Requirements for School Lunches.—A statement of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association.

HISTAMINE AND THE TOXEMIA OF PREGNANCY

Since the presentation in these columns¹ of a discussion of the presence of histidine in urine during pregnancy and its significance as a diagnostic sign, further information has accumulated. Careful study by a number of investigators has given somewhat conflicting results. The Tschopps,² who examined 600 specimens of urine from 300 patients, reported that histidinuria was found in both males and females, in health and in disease. These data have been essentially confirmed by Racker,³ who however demonstrated a considerably larger quantity of histidine in the urine of pregnancy than in normal urine. Langley⁴ concluded that, while the estimation of histidine in the urine cannot be recommended as a reliable test for pregnancy, it may be a valuable aid in the rapid diagnosis of, or routine testing for, pregnancy. Again, Racker⁵ has recently demonstrated that the amounts of histidine which can be isolated from such urine agree with the colorimetric estimations. While excretion of histidine is usually augmented in pregnancy, this result cannot be relied on as the sole diagnostic of this condition.

Kapeller-Adler has now reported further interesting implications of histidine metabolism in pregnancy and presents suggestive relationships of a metabolic product derived from histidine, namely histamine, to the toxemia of pregnancy. This pharmacologically potent base is known to arise normally from histidine in the large intestine; whether the histamine normally present in the various organs of the body has this origin or is actually formed in the various tissues is debatable. Werle and Krautzun⁶ have reported that animal tissues, notably kidney, do have the ability to decarboxylate histidine to histamine. In her more recent report, Kapeller-Adler⁷ has observed that, in patients with serious symptoms of preeclamptic toxemia, histidine was entirely absent from the urine or was present only in traces. The results have been so consistent that the author proposes the lack of excretion of histidine as a salient feature of profound toxemia. Moreover, improvement was always accompanied by an increase in excretion of histidine, which may be considered a favorable sign in the clinical condition.

In view of the evidence, Kapeller-Adler has investigated the possible nature of this derangement. Instead of being excreted, histidine is possibly being transformed into some other compound, probably one of pharmacologic activity. From a consideration of the chemical structure of histidine, its conversion to histamine seemed likely.

Histamine has been isolated⁸ from the urine in each of 6 cases of toxemia of pregnancy. A detectable amount of histamine could not be obtained, however, from 39 liters of normal pregnancy urine. These observations strongly suggest that the histamine isolated from urine in cases of toxemia of pregnancy was derived from histidine, which is normally excreted in the urine in considerable quantity throughout pregnancy.

Although many pharmacologic actions brought about by histamine⁹ indicate a basis for explaining the pathogenesis and course of toxemia of pregnancy, the mechanism whereby histidine is changed to histamine in eclampsia is not at present clear. The current evidence in connection with histamine and its relation to eclampsia is suggestive and warrants further carefully controlled study.

Current Comment

BLOOD DONATIONS FOR THE ARMED FORCES

Elsewhere in this issue¹ appears a report by Taylor discussing the need for and technical aspects of obtaining large quantities of blood plasma for the United States Army and Navy by the American Red Cross. It is apparent that a great expansion in facilities for collection of plasma is necessary if the required quantities are to be made promptly available. It is also noteworthy that the work already done by the Red Cross confirms previous reports that the withdrawal of 500 cc. of blood has no harmful effect on the health of properly selected donors. In view of the care with which the Red Cross has approached the problem, there should be no difficulty encountered in obtaining volunteer blood donors in sufficient numbers to satisfy all legitimate needs.

DOMESTIC WOVEN CATHETERS

Prior to 1939, woven catheters were made only in France, Italy and Germany. Now domestic products, made by American manufacturers, which are said to surpass foreign catheters in strength, durability and resistance to heat and chemicals are available. A catheter is a woven tubing, with the fabric base coated and polished to the desired size. Silk has been used as the base and natural resins and linseed oil for the coating. New machinery has been devised to speed up production, and nylon has been substituted for silk as the fabric base. American manufacturers have eliminated 70 per cent of the hand labor. Although there is apparently no price difference between domestic and foreign makes, the development of this substitute for foreign imports is particularly timely.

1. Urinary Histidine in the Diagnosis of Pregnancy, editorial, J. A. M. A. **106**:2240 (June 27) 1936.

2. Tschopp, W., and Tschopp, H.: *Biochem. Ztschr.* **298**:206, 1938.

3. Racker, E.: *Biochem. J.* **34**:89 (Jan) 1940.

4. Langley, W. D.: *J. Biol. Chem.* **132**:255 (Jan.) 1941.

5. Racker, E.: *Biochem. J.* **35**:667 (June) 1941.

6. Werle, E., and Krautzun, K.: *Biochem. Ztschr.* **296**:315, 1938.

7. Kapeller-Adler, Regina: *J. Obst. & Gynec. Brit. Emp.* **48**:141 (April) 1941.

8. Kapeller-Adler, Regina: *Biochem. J.* **35**:213 (Jan.) 1941; *J. Obst. & Gynec. Brit. Emp.* **48**:155 (April) 1941.

9. Goodman, Louis, and Gilman, Alfred: *Pharmacological Basis of Therapeutics*, New York, Macmillan Company, 1941, p. 566.

1. Taylor, E. S.: *Blood Procurement for the Army and Navy*, this issue, p. 2123.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

EMERGENCY MEDICAL SERVICE FOR CIVILIAN DEFENSE

All emergency medical field units, whether organized primarily within or outside of hospitals, should be related to hospitals wherever possible. Their constituent subdivisions, the emergency medical squads, should alternate on periods of duty so as to be available to respond promptly day or night to the call of the district control center. During "waiting" periods, hospital or field drills should be held weekly.

The movement of medical field units will be controlled from the district control center, which will receive air raid warnings from the military establishments in the area. On the sounding of the alert, they will prepare for action but will not move until ordered by the district commander. A main control center will coordinate the activities of all district control centers of a large city or area. Smaller cities operate through a district control center; larger cities are subdivided into a number of districts, each under a district commander in control of the movement and activities of all civilian defense forces within his district. If the medical facilities of the district should prove inadequate to handle the load of the casualty stations and first aid posts or if the hospitals in or assigned to the districts are filled to capacity, assistance can be obtained by appeal to the main control center.

To coordinate these medical activities, the chief of emergency medical service is to be represented on the staff of the main and district control centers. Each control center will require the services of three medical adjutants, so that one will always be on duty. For these assignments the local chief of emergency medical service

should provide and instruct an adequate number of medical adjutants.

The medical adjutant in the District Control Center will keep informed of:

1. The location and number of emergency medical squads available in or assigned to the district.
2. The location of sites in the district designated by the chief of emergency medical service as casualty stations.
3. The location and number of hospital beds in or assigned to the district which are available to receive casualties.
4. The location and number of ambulances and other vehicles assigned to the emergency medical service of the district under a transport officer.
5. The maximum number of casualties which the staff of each hospital in or assigned to his district is capable of handling daily. During an incident he should be constantly advised of the number of casualties admitted to each hospital so as to be able to divert casualties to the less crowded institutions and avoid overloading.

The medical adjutant in the main control center will keep informed through the district control centers of the daily census of hospital beds available in all districts of the area and of the status of all emergency medical field units and of all ambulances and other vehicles available in the various districts. He must decide which unit or which hospital in another district will be called into service when the facilities of a given district are overloaded.

Constant vigilance in the exercise of these responsibilities is necessary if the Emergency Medical Service is to function rapidly and effectively in times of need.

GEORGE BAEHR, M.D., Chief Medical Officer.

A PANORAMIC SKETCH OF U. S. ARMY MEDICAL SERVICE TODAY

JOSEPH R. DARNALL, M.D.

Lieutenant Colonel, Medical Corps, U. S. Army

Washington, D. C.

The Army Medical Department is made up of a number of component corps, including the Medical Corps, Dental Corps, Veterinary Corps, Medical Administrative Corps, Sanitary Corps, Nurse Corps and a number of enlisted personnel, all under the direction of a Major General who is the Surgeon General of the Army. Medical Department soldiers comprise about 75 per cent of the total enlisted strength of the Army.

The Surgeon General is selected by the President from among the senior colonels of the Medical Corps and is appointed for a term of four years. The Medical Corps component of the Medical Department is composed exclusively of doctors of medicine who are commissioned in the various grades from First Lieutenant to Colonel, inclusive.

Assistants to the Surgeon General include three brigadier generals who are chosen from the senior officers of the Medical Corps, and one brigadier general who is chosen from the senior

officers of the Dental Corps. During the present military expansion half a dozen senior colonels of the Medical Corps have been made temporary brigadier generals.

MEDICAL SERVICE OBJECTIVES

The Medical Department exists primarily for the constructive purpose of conserving military man power and thus preserving the strength of the armed forces. In general, this is accomplished (1) by the selection, through properly conducted physical examinations, of only those men physically fit for military service; (2) by keeping such personnel in good physical condition, through the application of modern principles of preventive medicine; (3) by furnishing those who do become disabled with such aid, in the form of evacuation and hospitalization facilities, as will speedily restore them to health and fighting efficiency.

Like other branches of the Regular Army in peacetime, the Medical Department devotes as much time as is practicable to the training of its personnel for field duties. But because of the major mission of caring for the sick and injured, only a small proportion of medical personnel can be engaged in field training activities at any one time.

From the Professional Service Division, Office of the Surgeon General, War Department.
Read in the Scientific Sessions of the Second Triennial Medical Alumni Reunion, University of Michigan Medical School, Ann Arbor, Mich., Oct. 3, 1941.

During war or serious threat of hostilities, the Regular Army, supplemented by the National Guard and Officers' Reserve Corps, forms a nucleus for the development of a potentially powerful defense force. As Medical Department expansion is obliged to keep pace with the general growth of the military establishment, officers of the Regular Army Medical Corps, for the most part, must forsake their normal professional activities to take over Medical Department executive and administrative duties. The actual care of the sick and injured then falls chiefly on Reserve Officers who are called to active duty. Even so, there is much medicomilitary work of an administrative nature to be done by newly activated Reserve Officers. Therefore it is sometimes impracticable to assign Medical Reserve Officers to purely professional duties within their chosen fields of specialization. Every reasonable effort is made, however, to place individuals in positions where their training and ability may be used to best advantage.

PERSONNEL

The United States Army, which on July 1, 1939 consisted of approximately 13,000 officers, 675 nurses and 174,000 enlisted men, today has expanded nearly tenfold to include approximately 90,000 officers, 6,000 nurses and 1,480,000 enlisted men. Of this number about 14,000 are Medical Department officers and 109,000 are Medical Department soldiers. At present there are more officers on active duty in the Medical Department alone than were in all branches of the Regular Army combined in 1939. These officers include approximately 10,000 physicians in the Medical Corps, 2,300 dentists in the Dental Corps, 600 veterinarians in the Veterinary Corps, 1,000 nonprofessional officers in the Medical Administrative Corps and 200 technical officers in the Sanitary Corps.

Enlisted Medical Department recruits are sent, if practicable, to one of three Medical Department replacement training centers. These centers are located at Camp Grant near Rockford, Ill., at Camp Lee, near Petersburg, Va., and at Camp Berkeley, near Abilene, Texas. The replacement centers give new recruits thirteen weeks of intensive basic military training before they are permanently assigned to tactical units or stations.

In order that one may visualize how and where the commissioned and enlisted personnel of the Medical Department are utilized, I will describe briefly the more important installations.

THE SURGEON GENERAL'S OFFICE

The Office of the Surgeon General, War Department, in Washington, D. C., is the nerve center of the Army Medical Department. This office is under the direction of Major General James C. Magee, the Surgeon General of the Army, and at present includes a staff of approximately 100 officers, 4 nurses and 740 civilian employees.

The office is organized into twelve divisions to facilitate the performance of its diverse functions. It is in this office that Medical Department policies are formulated and administrative supervision of professional services to the sick and injured personnel of our Army is maintained. One division of this office manages all of the fiscal and supply business of the Medical Department, while another division is charged with the selection, classification and disposition of commissioned and enlisted medical personnel. The office, through its Preventive Medicine Division, exercises advisory supervision over military sanitation and control of communicable diseases in the Army.

The Surgeon General's Office coordinates the development of adequate facilities for the hospitalization of all sick and injured military personnel. Actual construction of hospitals, however, is a responsibility of the Quartermaster Corps. Vital statistics pertaining to the military establishment, monthly reviews of the health of the Army, and annual reports of the Surgeon General are prepared here.

The office administers the Army Medical Library, the largest medical library in the world. Dental, veterinary and nursing divisions of the office are charged with the administrative, professional and advisory supervision over the activities of their respective corps. Another division is concerned with Medical Department planning and training activities.

Let us now consider some other Army medical establishments. The more important ones are the military hospitals, dispensaries, medical supply depots, medical service schools and field medical installations. Some of these establishments, such as the Medical

Department service schools, general hospitals and supply depots, are under direct control of the Surgeon General. Others are under the decentralized control of one of the nine corps area commanders, each of whom has a corps area surgeon and medical assistants on his staff of technical advisers.

MILITARY HOSPITALS

Army hospitals fall into two main classes: (1) fixed and (2) mobile. The latter are intended primarily for use with the field forces in the combat zone of a theater of military operations. Army hospital bed capacity is planned so as to provide fixed hospitalization for 5 per cent of the total military population. Facilities are designed so that expansion can easily be accomplished to care for an additional 1 per cent. This may seem a high percentage, but actually it is not excessive when one realizes that sick soldiers cannot remain in barracks. Individuals with minor illnesses who would ordinarily be treated at home in civil life must, in the Army, be hospitalized. At present the fixed Army hospitals, including those under construction, provide facilities for the care of approximately 96,000 patients.

Fixed (immobile) hospitals include general and station hospitals. The Army general hospitals are capable of caring for 1 per cent of the total military population, while station hospitals are equipped to care for 4 or 5 per cent of all military personnel. Thus hospitalization is immediately available for 5 per cent of the entire Army and, when necessary, the facilities can be rapidly expanded to care for 6 per cent of the military population.

Prior to the current military expansion, the Army maintained only five general hospitals and about one hundred station hospitals within the continental limits of the United States. Now there are fourteen general hospitals with a total capacity of more than sixteen thousand beds. In addition to the facilities available in Army general hospitals, there are at present, completed or under construction, accommodations for approximately 80,000 patients dispersed in about two hundred and twenty-eight Army station hospitals. These establishments vary in size from twenty-five beds to more than two thousand beds each. Plans for further construction of station hospitals have been recommended which will bring the grand total of station and general hospital beds up to more than one hundred and twenty-five thousand. This should be sufficient for an army of 2,500,000 men.

Our vast military housing program has included erection of the aforesaid hospital facilities. Unlike the older permanent Army hospitals, practically all of the new buildings are of the cantonment type, as construction of permanent buildings was not authorized.

It may be recalled that, during the first World War, the American Red Cross assisted the Army by organizing the staffs of fifty base hospitals at certain civilian medical institutions in this country. In 1918 it was my privilege to serve overseas with an evacuation hospital on the western front in France, and later with our Army of Occupation in Germany. Although the mobile hospital to which I was assigned was not a "sponsored" unit, much praise was bestowed on those splendid hospitals that arrived in France with their staffs fully organized and ready to function.

Recognizing the value of the sponsored base hospitals of 1917-1918, the War Department has authorized the creation of similar affiliated units in many of the teaching institutions and larger hospitals in the United States. Today our so-called sponsored or affiliated units include sixty-eight general hospitals, thirty evacuation hospitals and twenty-five surgical hospitals. These units form no part of the Selective Service training program and are not yet an active part of the military establishment. They are designed to function in theaters of military operations and will be called into active service only in the event of a general mobilization.

The University of Michigan sponsored unit is General Hospital No. 298, with an organized hospital staff that can be quickly augmented and ready to serve, if need be, in any theater occupied by our field forces.

MILITARY DISPENSARIES

Although Army hospitals provide both inpatient and outpatient service, we also have outpatient establishments which are not attached to hospitals. These independent units, which are known as "dispensaries," are equipped to render outpatient service to

military personnel not requiring hospital care. Like Army hospitals, they are classified as "fixed" and "mobile."

The Medical Department maintains fixed general dispensaries in some of our large cities, where the size of the military population warrants their establishment, to provide outpatient medical service for military personnel stationed in those cities. There are also fixed station dispensaries (formerly known as infirmaries) at many Army stations to provide outpatient service. These station dispensaries are usually not established at small or compact military posts where station hospitals are provided. They are maintained only at small posts where no hospitals are in operation or at very large posts where, although there are station hospitals, separate outpatient services are desirable. Decentralized dental clinics each equipped with fifteen or twenty-five dental chairs and operating under the remote control of the hospital commander, are also maintained at large stations, especially where troops are scattered in widely separated areas over a large reservation.

Mobile, or unit, dispensaries are provided to serve the non-hospital medical needs of troops in the field. In the combat zone during war or during field maneuvers these mobile or unit dispensaries are called aid stations.

MEDICAL SUPPLIES

The Army Medical Department is charged, among other responsibilities, with the procurement, storage and distribution of all medical supplies used by the Army. This entails an organization of specially trained medical officer personnel, who receive practical instruction in the Army medical supply depots, which are strategically located throughout the country. Medical officers who specialize in supply work are also trained in the Finance and Supply Division of the Surgeon General's Office and are given a course of instruction at the Army Industrial College.

Medical supplies fall into two broad classes; namely, (1) those items which are employed in the routine care of the sick and injured and (2) those items used by tactical units and known as field equipment. The first broad class of medical supplies includes matériel commonly utilized in civilian medical practice. Ordinarily these items may be obtained commercially without difficulty, and their rate of consumption varies more or less uniformly with the size of the Army. Field equipment, on the contrary, is largely noncommercial, more difficult to obtain, and the rate of consumption of its different items varies from a negligible amount in time of peace to the enormous quantities which may be expended during "all out" major hostilities. Field medical equipment includes principally those items and assemblies which are peculiarly adapted for emergency medical service and evacuation of battle casualties in a theater of military operations, particularly in the combat zone.

The Medical Department at present maintains seven active supply depots in the continental United States. These depots are located at New York, Chicago, St. Louis, San Francisco, Savannah, San Antonio and Seattle. Three reserve medical supply depots are also organized and held in readiness but are inactive. Four depots are maintained outside the continental United States in Panama, Puerto Rico, Hawaii and the Philippines. More than 4,000,000 square feet of storage space is utilized in properly assembling, storing and distributing the medical supplies for our present Army of approximately 1,570,000 officers and men.

MEDICAL DEPARTMENT SERVICE SCHOOLS

Facilities for special instruction and training are available at a number of Medical Department establishments. One of the heaviest training loads falls on the Army Medical Center in Washington, D. C., which includes the Walter Reed General Hospital, Army Medical School, Dental School, Veterinary School, Army School for Dietitians and a school for physical therapy aides.

The Army Medical School normally conducts a four months course in postgraduate work for Regular Army medical officers. This course, lasting from September through December, places emphasis on practical laboratory work, preventive medicine and professional medical problems peculiar to military service. Special one month intensive courses in tropical medicine are now being held at the Army Medical School. This instruction trains about thirty medical officers each month in the essentials of

tropical medicine. The school also gives special courses for enlisted laboratory and x-ray technicians, engages in medical research concerning problems relating to the military service, and manufactures certain biologic preparations, including all the typhoid vaccine used by the Army, Navy, Public Health Service and Civilian Conservation Corps. The Veterans' Administration, Indian Service and many other agencies are likewise supplied with vaccine from this laboratory, which manufactured 33,500,000 cc. of typhoid vaccine last year.

The Medical Department also maintains a Medical Field Service School at Carlisle Barracks, Pa. This institution is equipped to teach medical military tactics and administration, which otherwise might be learned, perhaps painfully, only in the school of experience.

According to Army Regulations, the objects of the Medical Field Service School are:

1. To instruct and train Medical Department officers in the principles and methods of medical field service so as to increase their ability as instructors and to enhance their proficiency in the performance of their command and staff duties.
2. To instruct and train selected enlisted men of the Medical Department in the duties of noncommissioned officers pertaining to the organization, mobilization, training and operation of Medical Department units.
3. To act as an agency of the Surgeon General in the development and perfection of the principles and methods of field medical service.
4. To assist in the development of field sanitary equipment; to aid in the preparation and revision of Medical Department Training Regulations, instruction manuals and other publications; to make research in matters pertaining to the field duties of the Medical Department, and to disseminate to the military service information concerning the instruction and training used and developed at the Medical Field Service School.

The various courses of instruction at Carlisle parallel or dovetail one another so that the entire year is devoted to intensive teaching and training programs in which emphasis is placed on exemplary and applicatory methods of instruction. One of the important courses normally scheduled was a five months basic course for junior or newly commissioned officers of the Regular Army Medical Department. This basic course has been temporarily discontinued during the present emergency. The six weeks National Guard and Reserve Officers' course and the advanced course for Colonels, Lieutenant Colonels and Senior Majors of the Medical Department have also been discontinued for the present.

In addition to these regular courses at the Medical Field Service School, unit training camps and basic training camps were held throughout the summers prior to the present emergency to afford successive increments of Reserve Officers two weeks of field training.

Two eight week courses are now conducted annually, one beginning in September and the other in April, for the purpose of giving advanced instruction to selected noncommissioned officers of the Medical Department.

Each summer an R. O. T. C. camp is held at Carlisle, lasting six weeks. The practical field training afforded at these camps supplements the didactic instruction given during the academic year by officers at the medical school maintaining R. O. T. C. units. Similar medical R. O. T. C. camps are held each summer at several other military stations.

Because of the national emergency, the normal schedule of courses at the Medical Field Service School has been modified to meet the requirements for speed and mass production. Accordingly, short courses lasting a month were established in 1940. These are known as "refresher courses," and recently they have been lengthened to two months. These short courses, repeated every two months for new increments of officers, review the fundamentals of field medical service and furnish information concerning recent changes and advances in administration, organization, tactics and field equipment. Refresher courses are provided for Medical Department officers of all components of the Army, including Regular Army, National Guard and Reserve Corps. About five hundred officers at a time have received the benefit of these refresher courses in tactical training at Carlisle. Another three hundred officers per month have received refresher courses in hospital administration and

medical specialties at Army hospitals. The latter training includes forty exemplary and applicable courses in six different general hospitals. This instruction is aimed at familiarizing selected medical officers with the administrative routine of various military hospital staff positions, including commanding officer, executive officer, adjutant, registrar, mess officer, chiefs of services, section chiefs, ward officers and other hospital staff duties.

On July 1, 1941 an officer candidate school was established at Carlisle Barracks to train selected enlisted candidates for commission in the Medical Administrative Corps. The courses at this school last approximately three months and accommodate as many as two hundred and fifty students in each class.

Monthly courses in field sanitation are given at Carlisle to train enlisted sanitary technicians. Approximately one hundred enlisted men receive this instruction each month.

Nearly one thousand five hundred enlisted technicians are being trained each month in Army hospitals. This training is made available at six of the larger permanent Army hospitals. These enlisted student technicians receive special instruction in the work to which they will be assigned. The courses are intended to qualify selected enlisted men for assignment as technicians in x-ray, pharmacy, laboratory, veterinary, dental, medical and surgical services.

Twenty-four replacement training centers have been set up at twenty-one camps in various parts of the country. Newly inducted and volunteer recruits may be sent to these centers to receive basic military and tactical instruction in various branches of the service. Medical recruits, for example, are sent to one of three replacement centers, where they receive elementary individual training and at the same time are given instruction concerning Medical Department field units and installations.

I have stated that medical replacement centers have been established at Camp Lee, Va., Camp Grant, Ill., and Camp Berkeley, Texas. Medical Department soldiers who are not sent to one of these centers for the usual thirteen weeks of basic training receive equivalent elementary military instruction and training with the organizations to which they are assigned.

FIELD MEDICAL SERVICE

Time will not permit a discussion of medical field service organization or a comprehensive description of the more important Medical Department units that are designed to function in a theater of military operations. Briefly, these installations include, from front to rear:

Battalion and regimental aid stations to give prompt emergency treatment on the field of battle.

Collecting companies to carry the wounded from battalion areas to field hospitals, which are now known as "clearing stations."

Clearing stations (formerly called "field hospitals"), which provide necessary emergency surgical care, prepare casualties for further evacuation to the rear and return to duty those patients who are trivially wounded and not incapacitated.

Mobile surgical hospitals, which operate independently, adjacent to clearing stations, to care for extremely urgent cases and nontransportable wounded.

Evacuation hospitals, which are mobile and yet provide facilities for skilful surgical treatment of battle casualties in the combat zone.

Convalescent hospitals, near the front, where slightly wounded and sick may be detained with a view to their early return to combat units.

Convalescent camps behind the combat zone, to which rear area hospitals may send convalescing patients.

Medical supply depots in the theater of operations to receive, store and issue medical supplies and equipment for the field forces.

Field laboratories to render clinical and epidemiologic laboratory service.

Hospital trains and airplane ambulances to accomplish transfer and evacuation of patients behind the combat zone.

Station and general hospitals in theaters of operations to furnish definitive treatment and hospitalization behind the combat zone.

Each mobile surgical hospital contains, in addition to shelter, one mobile surgical unit, which possesses sufficient integral transport for its own movement, together with the necessary facilities for messing, supply and technical operation. There are two types of mobile surgical units, each with identical personnel and functions. One type moves its personnel and equipment by ordinary truck. The other type has four operating rooms, installed in a like number of bus or van type motor vehicles, in which the unit performs its technical functions.

During a great battle, such as the Meuse-Argonne in the first World War, the Medical Department may have under its immediate control more than one fourth of all the military personnel of a field force. For example, about 15 per cent of the force may become casualties, while more than 10 per cent of the force may be medical personnel required to care for the casualties, all under Medical Department control.

I have said nothing of our Army medical organization in the Philippines, Hawaii, Panama, Puerto Rico, Alaska or in the recently acquired military bases at Newfoundland, Iceland, Bermuda, Jamaica, Trinidad, British Guiana and elsewhere. Service beyond the continental limits of the United States is loosely referred to as "foreign service." Army medical men seldom dislike such assignments. Foreign service, despite its hardships, may be alluring in many ways. Furthermore, foreign service reveals to the medical officer many fascinating vistas for scientific research.

Beneath tropical skies and towering coconut palms at some of our Army outposts, medical men in uniform carry on a relentless battle against disease. Amid exotic surroundings, among strange peoples, on the fringes of deadly swamps and jungles, Army doctors are afforded professional opportunities which do not exist in the environments of our homeland.

Army medical service involves much more than professional attendance on the sick and injured. It is concerned with the organization, administration, supply, training, sanitation and field tactics of medical troops, as well as evacuation, professional care and proper disposition of military patients, at home and abroad.

Whatever may be his professional aptitude or accomplishments, the physician who seeks a career in the Army must ultimately embrace the entrancing subject of military medicine. He may do so eagerly and with devotion or he may be obliged to accept, reluctantly, the military responsibilities which are inevitable in such a career. It is on the trained medical officer that new doctors in uniform must lean heavily for advice and guidance in times of great national emergency. And it is on these new doctors, drawn into the Army from civil life, that the trained medical officer must rely for cooperation, common sense, sacrifice and professional skill.

Teamwork is a strong bulwark against inefficiency. The Medical Department, both in the zone of the interior and in the theater of operations, is one of the most important cogs in our military machine and indispensable to national defense. But it is only a part of the team. During the perilous times which lie ahead, I urge those of you who may serve in the Medical Department of the Army to cultivate the twin virtues patience and tolerance. Try to understand and cooperate with the military system. Its necessary complexities are often misunderstood, and at times misrepresented as gross inefficiency, especially by inexperienced critics. After all, it is our cherished democratic system which necessitates most of the red tape, delay and seemingly wasted motion. There is generally a good but perhaps obscure or incomprehensible reason for every action or inaction which so often irks the newcomer in the Army.

Medicomilitary enthusiasts, imbued more with tactical considerations than with tact, have in times past overstepped the bounds of common sense by admonishing the newly commissioned Army doctor, when he is assigned to field service, to forget that he is a doctor and to remember only his purely military problems. Such council, of course, can serve no useful purpose and is properly resented by medical men.

In closing, I would advise the physician who dons the Army uniform never to forget that he is a Doctor of Medicine. But he should recognize the fact that efficient military medical service often demands stern and perhaps heroic adherence to the doctrine of "the greatest good for the greatest number."

ORGANIZATION SECTION

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—H. R. 4853 has been reported to the Senate, proposing to authorize the hospitalization of retired officers and enlisted men who are war veterans on a parity with other war veterans. H. R. 4905 has been reported to the Senate, proposing to facilitate standardization and uniformity of procedure relating to the determination of service connection of injuries or diseases alleged to have been incurred in or aggravated by active service in a war, campaign or expedition. H. R. 6135 was reported to the House with recommendation that it pass, proposing to authorize an additional appropriation of \$150,000,000 to construct community facilities in defense areas, including hospitals, health centers and clinics. Subsequently the authorization for the additional appropriation contemplated by this bill was included in another pending bill, H. R. 6128, and that bill has passed the House.

Bills Introduced.—S. 2105, introduced by Senator Clark, Missouri, and H. R. 6196, introduced by Representative Bland, Virginia, propose that it shall be unlawful for any person to produce, manufacture, compound, possess, sell, give away, deal in, dispense, administer or transport marihuana in the Canal Zone except under a license issued by the governor of the Panama Canal. The governor will be authorized to issue any licenses necessary to permit such uses of marihuana as are related to its administration to patients by physicians, dentists, veterinary surgeons and other practitioners or to research, instruction or

analysis. H. R. 5906, introduced by Representative Barden, North Carolina, proposes to authorize annually an additional appropriation of \$5,000,000 to be allotted to the several states to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise. The term "physically disabled persons" is defined to mean any person who by reason of a physical defect or infirmity, whether congenital or acquired by accident, injury or disease is, or may be expected to be, totally or partially incapacitated for remunerative occupation. The term "vocational rehabilitation" is defined to mean the rendering of any services necessary to the fitting of a physically disabled person for a remunerative occupation. H. R. 6116, introduced by Representative Van Zant, Pennsylvania, proposes to authorize the Administrator of Veterans' Affairs to insert a provision in all national service life insurance contracts granting the insured protection against permanent total disability occurring while his contract of insurance is in force. H. R. 6216, introduced by Representative Downs, Connecticut, proposes to extend the federal old age and survivors' insurance benefits provisions of the Social Security Act to include hospital employees, beginning July 1, 1942.

DISTRICT OF COLUMBIA

Change in Status.—H. R. 5694 has passed the House and Senate, proposing to prevent the sale of unwholesome food in the District of Columbia.

MEDICAL ECONOMIC ABSTRACTS

BRITISH COLUMBIA PREPAYMENT PLAN

The British Columbia Medical Association has organized a prepayment plan which became effective Nov. 1, 1940.¹

The Medical Service Association is incorporated under the "Societies Act" and brings together along industrial lines those interested in medical care by prepayment—employees, employers and doctors. There are three classes of members—employee members, employer members and professional members. The employee members elect two directors, employer members and professional members each elect one director. This representative board of directors is elected by the membership at large and serves without pay. The Medical Service Association is a nonprofit service organization and all dues collected are used or held for providing services to its beneficiary members and their dependents. Not more than 10 per cent of the dues may be used for administrative expenses.

Medical and surgical care includes services rendered by any doctor of medicine in the province in the home, the doctor's

office or the hospital, consultations, special medical services, such as x-ray, diagnostic aids, and laboratory examinations and the services of specialists. Thirty-five dollars is paid the doctor for obstetric services when the mother has been enrolled for ten months, including antepartum, confinement and postpartum care.

A fundamental principle adhered to in the development of the Medical Service Association has been that the paper work to be required of physicians should be kept at a minimum.

Payments are made to the doctors, not to the subscriber, and are at the rate of 75 per cent of the schedule of minimum fees of the College of Physicians and Surgeons.

For the period of operation the estimates of costs have been adequate to discharge the obligations of the Medical Service Association for medical, surgical and hospital care and to set aside a reserve for contingencies of 12 per cent of the dues.

The Medical Service Association now has nine hundred subscribers. The service has had to meet competition of contract practice and plans with salaried doctors, many of which are on a financial basis equivalent to poor relief costs. Negotiations are going on with hospital service plans to arrange for some type of cooperation.

¹ MacEwen, S. Cameron: Medical Economics, address at the Session on Medical Economics, Annual Meeting of the British Columbia Medical Association, Sept. 16, 1941, Bull. Vancouver M. A. 17:1 (Oct.) 1941.

WOMAN'S AUXILIARY

Arkansas

The auxiliary to the Bowie and Miller Counties Medical Society met for the first meeting of the current season at the home of Mrs. N. B. Daniel, September 26. Mrs. Calvin Churchill of Batesville, president of the state auxiliary and guest of honor, talked on health education, *Hygia*, health legislation and student loan funds.

The public relations meeting, October 24, was in the form of a "Nutrition Forum." The Washington County auxiliary met September 2. Seven subscriptions for *Hygia* were provided to county schools as a gift from the auxiliary.

West Virginia

The Woman's Auxiliary to the Academy of Medicine of Parkersburg opened their fall program at a joint meeting with the state auxiliary's executive board, October 8. The hostesses for the afternoon were Mrs. B. O. Robinson, Mrs. R. H. Wharton, Mrs. Athey Lutz and Mrs. A. C. Wooster. The local president introduced Mrs. Welch England. Mrs. V. E. Holcombe, formerly president of the national auxiliary, introduced Mrs. R. E. Mosiman of Seattle, president of the national auxiliary and guest speaker, whose subject was "Problems in Health Defense in Connection with Our National Defense Program."

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

Annual Registration Due January 1.—Every person practicing medicine, surgery or osteopathy in Arizona is required by law to pay annually on or before January 1, to the board of medical examiners, a renewal license fee of \$3. Any licensee who does not renew his license as required is to be penalized \$1 for each day that he practices without a renewal license, not to exceed \$50. The board of medical examiners is to revoke the license of any licensee who fails to renew his license for three successive years.

ARKANSAS

Annual Registration Due on or Before January 1.—All licensees of the State Medical Board of the Arkansas Medical Society are required by law to register with the board on or before January 1 and at that time to pay such fee as has been set by the board. If a licensee fails to pay the required annual fee before March 1 of any year his license to practice automatically expires but may be reinstated on the payment of all delinquent fees and a penalty of \$1 for each year, or part thereof, of delinquency.

CALIFORNIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in California is required by law to register annually, on or before January 1, with the secretary-treasurer of the board of medical examiners and at that time to pay a fee of \$2. Failure to pay the required fee within sixty days after January 1 works a revocation of a license, and thereafter a license may be reissued only after application and the payment of a \$10 penalty. The required fee, however, is waived with respect to licensees serving in the armed forces of the United States or in the United States Public Health Service.

Chiropractor Lovaas Convicted of Practicing Surgery.—A. M. Lovaas, a Santa Ana chiropractor, was recently convicted in the Santa Ana justice court on three counts of violating the laws regulating the practice of medicine in that he attempted to remove the tonsils of a patient by electrocoagulation. The court said that this procedure constituted the practice of surgery and that the license that Lovaas held did not entitle him to engage in such practice. A fine of \$250 was imposed on the first count and a jail sentence of thirty days on each of the remaining counts, the latter penalties being suspended during a probationary period. This case, it is reported, represents the first instance in which a California court has determined whether the removal of tonsils by electrocoagulation constitutes the practice of surgery.

CONNECTICUT

Annual Registration Due During January.—Every practitioner of medicine and surgery holding a license to practice in Connecticut is required by law to register during January with the state department of health and at that time to pay a fee of \$2. Licensees who have retired from active practice or who live out of the state must register annually but need not pay a fee. A practitioner failing to register is liable to a fine of not more than \$5.

FLORIDA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Florida is required by law to register annually on or before January 1 with the secretary of the state board of health and at that time to pay a fee of \$1. A licensee failing to register annually is liable to a fine of not more than \$50.

ILLINOIS

Personal.—Dr. Raymond H. Runde, Mount Vernon, Mo., has been named medical director and superintendent of the Peoria County Tuberculosis Sanatorium district, with offices in Peoria, succeeding Dr. David F. Loewen, Decatur, who has

held the position for three years. Dr. Loewen will occupy a similar position at the Macon County Tuberculosis Sanatorium district.

Conference on Public Health.—The annual Illinois Conference on Public Health was held in Springfield on December 4-5 with Dr. Roland R. Cross, state director of public health, as chairman. Among the speakers were:

Dr. Anton J. Carlson, Frank P. Hixon distinguished service professor emeritus of physiology, University of Chicago School of Medicine, Are Our Present Conceptions of Health and Disease Adequate?
Dr. Clarence D. Selby, Detroit, Industrial Hygiene in National Defense.
Dr. Clifford J. Barborka, Chicago, Nutritional Deficiencies and Public Health.
Henry T. Dean, D.D.S., dental surgeon, U. S. Public Health Service, Washington, D. C., Psychiatry and Public Health.
Dr. LeRoy M. Polvogt, Baltimore, Study of Impairment of Hearing in Children.

Chicago

Society News.—The Chicago Society of Internal Medicine was addressed, December 15, among others, by Drs. Paul H. Wosika, Frederic T. Jung and Chauncey C. Maher on "Does Urologic Hypertension Exist?" and Willard O. Thompson, Norris J. Heckel and Richard P. Morris, "Production of Skeletal and Somatic Aging in Young Boys with Chorionic Gonadotropin."—Dr. Jarrell Penn, Knoxville, Tenn., discussed "Treatment of Subtrochanteric Fractures of the Femur" before the Chicago Orthopaedic Society December 12 and Dr. Walter R. Fischer, "Management of the Food: An Orthopedic Responsibility."—The Illinois Psychiatric Society was addressed December 4 by Drs. Paul T. Cash, Omaha, on "Combined Curare-Electric Shock Therapy" and Ernest Lewy, Topeka, Kan., "Some Aspects of Compensation and War Neuroses."

IOWA

Personal.—Dr. Arthur Steindler, professor and head of orthopedic surgery, State University of Iowa College of Medicine, Iowa City, recently delivered twenty lectures in Spanish on orthopedic subjects and held several clinics in Mexico, under the auspices of the National University of Mexico, Mexico City.

Institute on Industrial Health.—A special institute on industrial health was conducted at Davenport, December 2, by the Iowa State Department of Health in cooperation with the speakers' bureau and the committee on industrial health of the Iowa State Medical Society for the practicing physician, the industrial physician and the industrial manager. Speakers included:

Dr. Clarence O. Sappington, Chicago, Medical Aspects of Industrial Hygiene; Medico-Legal Phases of Occupational Diseases.
Paul J. Houser, M.S., Des Moines, industrial hygiene engineer of the state department of health, Industrial Hygiene Methods.
Dr. Carey P. McCord, Detroit, Occupational Disease in Iowa; Organization and Costs of Medical Services in Industry.
Dr. Regnar M. Sorensen, Des Moines, Venereal Disease in Industry.
Dr. Philip H. Kreuscher, Chicago, Management of Industrial Injuries.
Dr. Eugene C. Wagner, Des Moines, Human Serum (pooled) in Shock and Hemorrhage.
Drs. Arthur Steindler and Frank E. Thornton, Iowa City, Low Back Pain: Diagnosis Before Treatment.
A. D. Matheson, Davenport, The Industrialist's Viewpoint.

The day's session concluded with a panel discussion participated in by these speakers and Dr. Walter L. Bierring, Des Moines, state health commissioner, and Dr. Howard A. Weis, Davenport, president of the Scott County Medical Society.

LOUISIANA

New Medical Officer at Veterans' Hospital.—Dr. Edward O. Sage, chief of the outpatient department at the Veterans' Administration Facility in Dearborn, Mich., has been made chief medical officer of the Veterans' Hospital, New Orleans, in charge of the entire Louisiana district. Dr. Sage had been with the Dearborn facility since 1922.

Personal.—Dr. Joseph C. Menendez, New Orleans, was recently appointed director of civilian defense in the Fourth Corps Area.—Dr. Mary Elizabeth Bass, New Orleans, was recently guest of honor at a banquet given by the local branch of the American Medical Women's Association. Dr. Bass was presented with a hand printed book containing the history of the local branch.

Society News.—The Orleans Parish Medical Society devoted its meeting, November 10, to a symposium on military medicine with the following speakers: Major Frank P. Rizzo, state medical officer, Louisiana Selective Service System, New Orleans; Lieut. Col. Samuel Charles Woldenberg, chief of surgical service, LaGarde General Hospital, New Orleans; Leo J. Schoeny, D.D.S., and Lieut. Comdr. James E. Fulghum, U. S. N. R., on duty with Naval Aviation Cadet Selection Board, New Orleans.

Annual Renewal Due January 1.—Every practitioner of medicine and surgery holding a certificate to practice in Louisiana is required by law to have his certificate renewed annually, on or before January 1, by the secretary-treasurer of the state board of medical examiners and at that time to pay a fee of \$2. The board may by unanimous vote revoke any certificate not renewed.

MARYLAND

New Director of Tuberculosis.—Dr. Miriam E. Brailey, associate in epidemiology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, has been appointed director of the bureau of tuberculosis of the city health department. Dr. Brailey graduated at Johns Hopkins University School of Medicine in 1930 and received the degree in public health the following year. In 1932 she became director of the outpatient clinic for tuberculous children in the Harriet Lane Home and joined the faculty of the school of hygiene and public health.

MICHIGAN

Wayne County Society Now Owns Its Home.—The Whitney Realty Company has presented the headquarters of the Wayne County Medical Society, 4421 Woodward Avenue, Detroit, to the society. The trustees and council of the society accepted the gift, and the membership unanimously voted its approval at a meeting on December 2. The house, which has been the society's headquarters rent free for ten years, will be known as "The David Whitney House." It was built by Mr. David Whitney, contains fifty rooms, and is famous for its carved wood and parquet floors, stained glass windows and twenty fire places. *Detroit Medical News*, the society's bulletin, carried special tributes in its December 8 issue to the Whitney Realty Company in appreciation of this magnanimous gift.

MINNESOTA

Annual Registration Due During January.—Every practitioner of medicine and surgery holding a license to practice in Minnesota is required by law to register annually during January with the secretary of the board of medical examiners and at that time to pay a fee of \$2. A licensee who practices without renewing his license is guilty of a misdemeanor and is liable to prosecution.

NEW JERSEY

Organize to Promote Moral and Physical Health.—A group of ministers and physicians met in West Orange on December 4 to discuss the organization of a clinic to promote the moral, spiritual and physical health of their community. The session was under the chairmanship of Rev. Dr. John A. MacSporran, president emeritus of the Hillside Presbyterian Church of Orange and extension secretary of the Committee on Religion and Health of the Federal Council of the Churches of Christ in America, cooperating with Drs. James S. Plant, director of the Juvenile Court of Newark, Theodore R. Ford, East Orange, and Briscoe B. Ranson Jr., East Orange. Definite plans were to be made at the meeting to hold a series of seminars in January at which the working organization was to be set up, newspapers reported. It is believed that the plan will assist the physician in teaching the minister to recognize symptoms of mental maladjustment and aid the minister in contributing to the physician's understanding of the situations that lead to mental disturbance and their frequent basis in spiritual sterility.

NEW YORK

Foods for Freedom Parade.—The nutrition defense committee of Rochester and Monroe County sponsored a foods for freedom parade in the Civics Exhibit Building, November 15-19. About sixty exhibits showed the composition of the human body, its needs and how these needs are met by different foods. In the evening the program included music by school orchestras and a lecture on nutrition. Health movies were shown continuously afternoon and evening.

Annual Registration Due January 1.—Every practitioner of medicine and surgery in New York is required by law to apply annually, on or before January 1, to the secretary of the board of medical examiners for a certificate of registration, on application forms furnished by him, and to pay at that time a fee of \$2. The law authorizes the secretary of the board to permit secretaries of duly incorporated medical societies to act as his representatives to receive and transmit to him such

applications and fees. Practitioners are liable to severe penalties for failing to register and for continuing in practice thereafter.

Civilian Defense Program to Safeguard Water Supplies.—The statewide civilian defense plan to prepare New York state municipalities for maintaining effective and safe water service under any emergencies started on October 31, when zone water supply coordinators and assistant coordinators from all sections of the state met in the state office building, Albany. The state has been divided into twenty-three water service zones, nineteen of which are coterminous with the nineteen state health districts. The other four comprise New York City and Nassau, Suffolk and Westchester counties. Earl Devendorf, assistant director of the division of sanitation, state department of health, has been named state water supply coordinator. The deputy commissioner of health and sanitary engineer of the New York City Department of Health, county sanitary engineers of the departments of health of Westchester, Suffolk and Nassau counties and the nineteen district sanitary engineers of the state department of health have been made assistant coordinators. Water supply coordinators will determine which municipalities and industries should have their water supplies interconnected and work with local water officials in effecting the interconnections.

Conference on Chemotherapy.—The New York State Department of Health and the state medical society sponsored a conference on chemotherapy in Albany, October 7-8, with the following speakers:

- Dr. Eli K. Marshall Jr., Baltimore, Chemistry, Absorption, Distribution, Conjugation and Excretion of Sulfonamides.
- Dr. Colin M. MacLeod, New York, Action of Sulfonamides on Bacteria in Role of Immunity in the Response to Chemotherapy.
- Dr. John K. Miller, Albany, The Approved Laboratory in New York State in Relation to Chemotherapy.
- Dr. William Barry Wood Jr., Baltimore, Modes of Administration and Preparation of Solutions.
- Dr. Maxwell Finland, Boston, Toxicity and Follow-Up of Patients.
- Dr. Chester S. Keefert, Boston, Clinical Use of Gramicidin and Penicillin.
- Dr. Norman H. Plummer, New York, Pneumonia.
- Dr. Cassius J. Van Slyke, Washington, D. C., Gonorrhea.
- Dr. Edwin F. Alyea, Durham, N. C., Infections of the Urinary Tract.
- Dr. John S. Lockwood, Philadelphia, Sulfonamides in Surgery—Local and General Use.
- Dr. Benjamin W. Carey, Pearl River, Use of Sulfonamides in Pediatrics.
- Dr. John H. Dingle, Boston, Treatment of Meningitis.

The conference was planned primarily in order that authoritative opinions on the best usage of these drugs would be directly accessible to a speakers' committee appointed by the state medical society. This committee will be available throughout the fall and winter to give a course on sulfanilamide, sulapyridine and related compounds to county medical societies, hospital staffs and other medical groups.

New York City

Third Harvey Lecture.—Dr. Robert F. Loeb, professor of medicine at Columbia University College of Physicians and Surgeons, delivered the third Harvey Society Lecture of the current series at the New York Academy of Medicine, December 18. His subject was "The Adrenal Cortex and Electrolyte Behavior."

Medical Service Plan for Ward Patients.—The Community Ward Service Plan, administered by the Associated Hospital Service under the direction of Dr. Sigismund S. Goldwater, was to start operating November 1, according to the *New York Times*. It is intended to provide hospital ward service and medical care on a contributory basis to persons with limited incomes, who would ordinarily be eligible for admission to the ward service of participating hospitals. Those eligible are employed single persons with incomes of \$1,200 a year or less, husband and wife with income of no more than \$1,680 a year, and families, including children, with incomes of no more than \$2,100 a year. Enrolment is permitted only on a group basis and premiums will be collected through payroll deductions. The subscription charges for the combined medical and hospital services are \$12 a year for individual subscribers and \$27 annually for families including all unmarried children under 18 years. The family subscription will provide maternity care as well as general medical services. Hospital services will include ward accommodations in participating hospitals for a period of twenty-one days, except in maternity cases, in which the period is limited to ten days. Services will include, in addition to bed and board and prescribed diets, general nursing care, operating room, delivery room, dressings, medications, drugs, anesthesia, physical therapy, cardiographic, cystoscopic, x-ray and laboratory examinations and all other essential services. At present the area covered

by the plan includes the five boroughs of New York City, Westchester, Nassau and Suffolk counties in Long Island, and Putnam, Dutchess, Columbia, Ulster, Orange, Rockland, Sullivan, Delaware and Greene counties adjacent to New York City.

NORTH DAKOTA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in North Dakota is required by law to register annually on or before January 1 with the secretary-treasurer of the board of medical examiners and at that time to pay a fee of \$5, if a resident of North Dakota, or \$2, if a nonresident. A practitioner may not lawfully practice if he has not registered. If he does so his license may be revoked and can be reinstated on the payment of unpaid fees and \$0.50 for each month of default.

OHIO

Monument Honors Memory of Physician.—The Logan County Medical Society, the Logan County Historical Society and the American Legion participated in the dedication near Middleburg recently of a granite monument to the memory of Dr. Phoebe Hames Sharp, who was the first physician to practice in Logan County. According to the *Ohio State Medical Journal* Dr. Sharp, who came to Logan County with her parents in 1801, was also the founder of the first school and the first church (Friends) in that section of the state. The monument is erected near the place of her burial. As part of the dedication ceremonies Dr. Lee E. Traul, Middleburg, representing the county medical society, related the progress of the medical profession in the county.

PENNSYLVANIA

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Pennsylvania is required by law to register annually, on or before January 1, with the board of medical education and licensure in the department of public instruction and to pay a fee of \$1 or such fee as may be fixed by the department of public instruction. A practitioner who fails to register and who continues to practice is liable to a fine of from \$10 to \$100.

Health Institute.—The second Pennsylvania Health Institute will be held at the Penn Harris Hotel, Harrisburg, January 14-16, under the auspices of the state department of health and cooperating health agencies. Included among the speakers will be:

- Dr. Benjamin F. Jones, Bethesda, Md., Fatigue as a Problem of Industrial Health
- Dr. Frank G. Boudreau, New York, Nutrition as a Problem of Industrial Health
- Dr. James G. Townsend, Bethesda, Md., Industrial Health at the Stutes' Level.
- Dr. C. Charles Burlingame, Hartford, Conn., Relation of the Public to Mental Health.
- Dr. Hubley R. Owen, Philadelphia, Aim of Local Health Administration in Preventive Medicine.
- Dr. Wilson C. Williams, Nashville, Tenn., Relationship of the State in Local Health Work.
- Dr. Robert B. Osgood, Boston, Public Health Aspects of Chronic Rheumatism.
- Dr. Elliott P. Joslin, Boston, What Is the Place of Diabetes in a Public Health Program?
- Ira Hiscock, C.P.H., New Haven, A Coordinated Program of Health Education for the Community.
- Lon W. Morrey, D.D.S., Chicago, Dental Health Education in the Schools.

Philadelphia

The Mutter Lecture.—Dr. Walter L. Palmer, professor of medicine, University of Chicago School of Medicine, Chicago, delivered the fifty-fourth Thomas Dent Mutter Lecture before the College of Physicians of Philadelphia December 3. His subject was "The Role of Acid Gastric Juice in Gastric and Duodenal Ulceration."

National Defense Night.—The Philadelphia County Medical Society designated its December 10 meeting "National Defense Night." The following program was presented:

- Dr. Hubley R. Owen, General Activities of the Philadelphia Defense Council.
- Dr. Rufus S. Reeves, Role of the Physician in Local Disasters.
- Col. Leonard G. Rowntree, medical director, Selective Service System, Washington, D. C., Results of Examination of Registrants and Their Rehabilitation.
- Dr. Edward A. Strecker, Neuropsychiatric Problems in the Military Service.
- Major General James C. Magee, surgeon general, U. S. Army, Washington, D. C., Review of Operations of the Medical Department in the Emergency.

School Health Meetings.—The American Academy of Pediatrics through its Pennsylvania committees announces the success of a new method to elicit interest of parents and teachers in the health of young children. A series of panel

discussions was held in eleven selected schools in and near Philadelphia. The program also included presentations by the local school orchestra, words of introduction by well known school or other leaders and the showing of the talking movie "Bobby Goes to School." Each panel consisted of a chairman and four associate pediatricians and in some cases an educator and a nurse. Each chairman was equipped with questions received from parents or teachers in advance or preselected as suggestive questions by panel members after the panel was started. Questions were invited from the floor on child health and school health problems. The meetings were timely because they were held at an early period in the school year when parents and teachers have to face a winter of possible infections and health is an important consideration. Eleven meetings in eleven schools reported an attendance of 175, 550, 500, 525, 500, 175, 125, 800, 1,000, 250 and 400, making a total of 5,000 consisting mostly of parents, teachers, doctors, social workers and nurses who attended these "Going to School Health Meetings." Plans are now being considered for a follow-up program to rivet the value of these meetings.

Pittsburgh

Mellon Institute Chemist Receives Remington Medal.—George D. Beal, Ph.D., assistant director of the Mellon Institute for Industrial Research since 1926, was awarded the Remington Medal of the American Pharmaceutical Association for 1941 at a dinner given by the New York branch at the Hotel Pennsylvania on December 4. Dr. Beal received the degree of doctor of pharmacy at Scio College, Scio, Ohio, in 1907 and doctor of philosophy at Columbia University, New York, in 1911. From 1911 to 1926 he was on the faculty of the University of Illinois, Urbana, becoming professor of analytic and food chemistry in 1924. He is a member of the Committee of Revision of the U. S. Pharmacopeia. In 1937 Dr. Beal was president of the American Pharmaceutical Association and in 1920 received the Ebert Prize awarded by the association.

TEXAS

Appointment at Texas.—Dr. Carl A. Nau, formerly director of the Texas division of industrial hygiene, is now professor of physiology and preventive medicine and head of the department, University of Texas School of Medicine, Galveston, it was recently announced. Dr. Nau graduated at Rush Medical College, Chicago, in 1935.

Annual Registration Due January 1.—Every practitioner of medicine and surgery holding a license to practice in Texas is required by law to register annually on or before January 1 with the state board of medical examiners and at that time to pay a fee of \$2. If a practitioner fails to renew his registration within sixty days after January 1, his license is suspended.

GENERAL

New Study on Alcohol Problems.—The Research Council on Problems of Alcohol will undertake a study of basic disorders and environmental factors that cause excessive drinking and the problem of alcoholism as it might affect industrial production, according to an announcement made at its annual meeting, November 25, in New York. One of eight group sessions was devoted to this phase of alcoholism. Dr. Winifred Overholser, Washington, D. C., was reelected chairman of the council's board and Dr. I. Ogden Woodruff, New York, was elected vice chairman.

Dr. Rappleye Named President of Macy Foundation.—Dr. Willard C. Rappleye, commissioner of hospitals of the city of New York, and dean and professor of medical economics, Columbia University College of Physicians and Surgeons, has been elected president of the Josiah Macy Jr. Foundation, New York, effective January 1, to succeed the late Dr. Ludwig W. Kast. The foundation is organized to further medical education. Dr. Frank Fremont-Smith is director of the medical division. For the four years 1937-1940 a report showed cash disbursements of \$951,512 for health studies and research.

New Annual Award in Urology.—The American Urological Association announces the establishment of an annual award, not to exceed \$500, for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize will be determined on merits of the work presented, and, if the committee on scientific research of the association deems none of the work submitted worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. Essays must reach the secretary, Dr. Clyde I. Deming, 789

Howard Avenue, New Haven, on or before April 1, 1942. The American Urological Association's principal object is "to encourage the study, improve the practice, elevate the standards and advance the cause of urology."

Annual Campaign for Infantile Paralysis Funds.—January 12 will mark the official opening of the annual campaign for funds to support activities of the National Foundation for Infantile Paralysis. On January 30, designated the Diamond Jubilee Birthday Celebration, birthday balls throughout the country will observe President Roosevelt's sixtieth birthday. National and local chairmen of the National Foundation for Infantile Paralysis met in annual session in Washington, December 2, to discuss plans for the forthcoming campaign and to hear reports on the foundation's activities of the past year in various states where severe epidemics of the disease were reported. During 1939, 1940 and 1941 nearly 26,000 persons have been stricken with infantile paralysis, it was stated. A percentage of the total funds collected in the annual drive is returned to the states for local aid, the remainder being retained by the National Foundation for maintenance, grants in aid and other projects.

Bibliography of Pharmacology and Chemotherapy.—Beginning with volume 3 (1942) the name of the *Bibliography of Pharmacology* is changed to *Bibliography of Pharmacology and Chemotherapy*. No change in scope is contemplated; "Chemotherapy" is added only to make the title more accurately descriptive. The *Bibliography's* field is defined thus: "A reference list of current American and foreign literature relating to the action of known chemical compounds (natural or synthetic) on animal organisms and to therapeutic use of such compounds, including clinical investigations but not including routine clinical and case reports." Format will be modified by heading each entry with a blank line for insertion of the subscriber's own index heading, as an aid to those who mount clipped *Bibliography* items on index cards. Below this line each entry will begin with an optional index heading (in capitals) selected by the compiler. The annual subscription rate is \$3.50, or \$2.50 to members of the Friends of the Hooker Scientific Library. Requests for more information or for a specimen page may be addressed to the Hooker Scientific Library, Central College, Fayette, Mo.

Fellowships in the Medical Sciences.—Fellowships in the medical sciences, similar to those which have been administered by the Medical Fellowship Board of the National Research Council since 1922, will again be available for the year beginning July 1, 1942. These fellowships, supported by grants from the Rockefeller Foundation to the National Research Council, are designed to provide opportunities for training and experience in research in all branches of medical science. They are open to citizens of the United States or Canada who possess an M.D. or a Ph.D. degree and are intended for recent graduates who are not yet professionally established. In addition to these fellowships the Medical Fellowship Board administers two groups of research fellowships, made available through a grant from the National Foundation for Infantile Paralysis, Inc. The first group, open to applicants who hold either the Ph.D. or the M.D. degree, is to provide opportunities for special training and experience in the study of filtrable viruses. The second group, open only to graduates in medicine who have completed one or more years of hospital experience in clinical surgery and are planning a career in orthopedic surgery, will provide opportunities for training and research in those basic medical sciences which will be of value in furthering progress in the field of orthopedic surgery. Fellows will be appointed at a meeting of the Medical Fellowship Board on February 28. Applications to receive consideration at this meeting must be filed on or before January 1. Appointments may begin on any date determined by the board. For further particulars address the Secretary of the Medical Fellowship Board, National Research Council, 2101 Constitution Avenue, Washington, D. C.

Hunt for Home and Farm Accident Causes.—The American Red Cross launched a five day "hazard hunt" on October 26 for the elimination of home accident causes, which in 1940 claimed thirty-three thousand lives, according to a release. The survey was to be conducted through the distribution of ten million "check lists," an index of hazards designed to help the householder locate and eliminate the dangers. A similar index, listing accident hazards of the farm, was to be distributed in rural sections. Teachers were provided with special material to interpret the "check lists" to enable school children to assist their parents in the "hazard hunt." The children also announced plans to sponsor accident prevention courses through the three thousand seven hundred chapters of the Red Cross, which is the first national program of its type to be undertaken by the organization. A minimum of nine

hours' instruction will be required for courses in home accident prevention and twelve hours to include farm accident prevention.

In reporting on its "hazard hunt," the Red Cross stated in addition to the thirty-three thousand deaths last year from home accidents, there were four thousand five hundred persons who died as a result of occupational mishaps on the farm. An estimated five million persons suffered home injuries involving hospitalization or treatment by a physician. Statistics provided by the National Safety Council reveal that more than half of all home accident deaths last year resulted from falls occurring on stairs, slippery floors, insecure rugs as a result of poor lighting and the use of chairs and other articles of furniture as improvised stepladders. Burns and accidental poisoning as causes of death were next in order. The mounting farm accident toll was attributed to mechanization of the American farm. Ill tempered animals was the second cause in this classification. Estimates place the number of "serious" type injuries at fifty for each farm accident death, a national total of two hundred and twenty-five thousand disabling injuries, the release stated.

CANADA

University News.—The Rockefeller Foundation has granted \$25,000 to McGill University Faculty of Medicine, Montreal, for research in endocrinology for five years under the direction of Dr. John S. L. Browne, assistant professor of medicine and pathologic chemistry, *Science* reports.

Officers of British Columbia Association.—Dr. Cecil H. Hankinson, Prince Rupert, was elected president of the British Columbia Medical Association at its recent meeting in Vancouver. Other officers are Drs. Alfred H. Spohn, Vancouver, and Philip A. C. Cousland, Victoria, vice presidents; Allen Y. McNair, Vancouver, honorary secretary-treasurer, and Morris W. Thomas, Vancouver, executive secretary. The association is the British Columbia division of the Canadian Medical Association.

New Publication on Biology.—The Société de Biologie de Montréal has announced the publication of a review which will be its official organ and which will contain also reports of research. The membership of the society includes physicians, physiologists, biochemists, pharmacologists, bacteriologists, zoologists and others. The *Revue canadienne de biologie*, which will be published in French, will appear under the auspices of the Université de Montréal. The society held its first meeting of the year recently in the laboratory of physiology at the university.

Personal.—Dr. Edmund Arnold G. Branch, Montreal, has been appointed director of the Provincial Bureau of Laboratories of New Brunswick. He succeeds Dr. Robert A. H. MacKeen, St. John, who has been named pathologist to Camp Sussex Hospital, an active service commission with the Royal Canadian Army Medical Corps. Dr. Branch has worked with the Rockefeller Institute, New York, Harvard Medical School, Boston, and McGill University Faculty of Medicine, Montreal. —Dr. Charles H. Best, professor and head of the department of physiology, and director of the Banting-Best Department of Medical Research, University of Toronto Faculty of Medicine, has been appointed honorary lieutenant-commander of the Royal Canadian Navy.

FOREIGN

Personal.—Dr. Leonard Gregory Parsons, professor of infant hygiene and the diseases of children, University of Birmingham Faculty of Medicine, Birmingham, England, who has been acting as deputy dean, has been named dean, succeeding Dr. Arthur Stanley Barnes, who resigned after serving for ten years, according to *Science*.

A Morison Shelter in His House.—A British correspondent writes on October 3: "Things are very quiet here now. We have had no air raid of any importance on London for many months. Severe damage has been done in many places, some of it irreparable in the case of historic buildings and the Museum of the Royal College of Surgeons, which I have described in my letters. But London is so vast that the damage is very small in proportion to the whole—nothing like 1 per cent I should say. We expect some trouble in the coming winter from the Luftwaffe, but not on the previous scale. For one thing they will probably be too busy elsewhere and for another they should have to pay more dearly for whatever they do. I have a Morison shelter in my house. It is an iron table guaranteed to hold up 73 tons. If the house should come down, those under the table cannot be crushed to death by the debris. I need not say we are all full of calm confidence in the future. We were that in our darkest hour when we stood alone after the collapse of France."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 1, 1941.

Medical Aspect of the Problem of High Production

All our energies are being put into our war effort with the object of the maximum of industrial production. But, being a free country, we have our critics. At a recent meeting of engineers to consider war production Mr. E. C. Gordon, chairman of the Engineering Industries Association, criticized output, stating that production in engineering industries, measured by square foot of factory space or pound weight of product per hour, has declined. To this criticism a leading physician, Dr. J. A. Ryle, professor of medicine in the University of Cambridge, has replied in the *Times*. He wonders whether it occurred to Gordon's audience to remember that other measurements besides square foot of factory space and pound weight of product per hour must be taken into account if a true assessment of causes and effects is to be reached and that the human machine, however willing, when called on to contribute "every available man hour" produces less—except over short periods of drive—than the human machine handled according to the rules which physicians, physiologists and psychologists have prescribed after careful study. Experience and experiment in times of peace and during the last war have clearly shown that during prolonged periods of pressure industrial fatigue results in falling output, and that output again increases when hours are shortened, proper rest periods are instituted and a sufficiency of holiday is allowed. After the evacuation of Dunkirk a general speed up became imperative for many months, but the rising tempo of the war has continued to demand a rising tempo of production. Long hours and overtime, the monotony of repetitive work, noise, journeys from and to the factory, private and public anxieties and rationing, not to mention patriotic zeal itself, have begun to have their anticipated effect on muscle and nerve and mind. Is sufficient attempt being made to counter these adverse forces?

The symptoms of industrial fatigue include bodily and mental weariness, poor sleep, flagging digestion or appetite, irritability or depression and a slowing up of movements and of memory. They commonly appear first in "the willing horse," that is, the more conscientious and efficient worker. These symptoms cannot be quantitatively assessed. The measurable symptom is falling output. Engineers are scientifically minded and should appreciate the contributions to knowledge made by their scientific colleagues, whose study is that of the most intricate and valuable of all machines—the human body. Professor Ryle feels sure that he would have the support of the whole medical profession in urging on the government the importance of this very vital aspect of the production problem.

Ocular Injuries in the War

At the annual congress of the Ophthalmological Society a discussion took place on the experiences of ocular injury in the war. O. M. Duthie said that ruptures had proved the most frequent of all serious injuries. Even when the injury was not severe the end results were deplorable. Many cases of rupture, especially those due to flying glass, were virtually untreatable. Subconjunctival ruptures, with or without dislocation of the lens, were not infrequent.

Solly Zuckerman restricted himself to civilian air raid casualties and dealt with injuries supposed to be due to blast. He had studied the records of the last war and found nothing to suggest that changes in the eyeball were produced by blast. At

relatively high pressures, to be experienced only close to the bomb, changes, of which the most common was retrobulbar hemorrhage, would occur, but such cases would probably end fatally in any event.

E. B. Alabaster analyzed 100 cases of eye injury admitted to a casualty hospital after air raids. Of these, 60 were cases of traumatic conjunctivitis, 21 were penetrating wounds caused by metal or glass, 6 were corneal abrasions, 5 were subconjunctival hemorrhage, 5 were injuries only to the lids and there was 1 case each of central retinal block, detached retina and orbital cellulitis. Of the 21 cases of penetrating wounds, 12 required enucleation of the eye.

Herbert Caiger said that nothing had brought home to him the horror of this war so much as the case of a man, aged 66, injured in a shelter. One eye was absent and the man declared that it had been blown right out of its socket, while the other eye showed detachment of the retina.

R. C. Davenport and others referred to the frequency with which intraocular foreign bodies were found to be nonmagnetic, in keeping with the low ferrous content of shell and bomb cases used in this war.

EYE PROTECTION IN WARFARE

Sir Richard Cruise said that at least 50 per cent of eye injuries such as ophthalmic surgeons saw in the last war could be prevented by some form of practical eye protection. As reported previously in *THE JOURNAL* (June 15, 1940, p. 2397) he has introduced a visor. It was urged against it that visibility was seriously impeded. Even if this were so, the visor need not be lowered on any occasion when it is likely to handicap the wearer. Harrison Butler pleaded for the use of an official visor not only for soldiers but for fire watchers and others engaged in civilian protection. The question was remitted to the council of the society to consider taking up with the Ministry of Home Security the issue of some form of eye protection along with the steel helmet for civilians.

Immediate Training of the Disabled

Heretofore there has been an interval after the discharge of disabled men from the hospital when they have been no one's particular care. Their medical and surgical treatment has ended before the business of restoring them to employment has begun. Mr. Bevin, minister of labor and National Service, has prepared a scheme which remedies this. No time will be lost in the training and resettlement in industry of persons disabled while on war service or in civil life. The scheme is designed to cover all disablement however caused—by wounds, industrial or other accidents or disease. It will be open to all persons over 16 who are unfitted by disablement from resuming their normal occupation as well as those who are handicapped by disablement from obtaining satisfactory employment. During the war it will be necessary to concentrate on training for occupations which are in demand in war time. From the patients themselves and from their physicians, individual requirements of employment will be ascertained, and possibly the expected employment may influence the process of rehabilitation. By making contact with a patient before completion of his hospital treatment, the Ministry of Labor will be able to interest itself in his future much earlier, and his return to employment will be made easier and quicker. Under present arrangements both men and women are already being trained in government training centers and technical colleges or with employers for various kinds of munition work. Many of these occupations are suitable for disabled persons. The new scheme puts them in the first and immediate category. Training allowances will be paid to men at the rate of \$8 and to women at the rate of \$6 a week. The juvenile rates are \$4 for boys and \$3.50 for girls. In addition, a person being trained is given a midday meal.

Ammonia and the Gas Mask

The government states that the gas mask which is issued to all civilians will protect against any gas likely to be used by the enemy. Ammonia is not in this class, and the masks are not designed for protection against it. But in an accident in an air raid which occurred a year ago it was found that some protection is afforded. The connecting pipe of an ammonia condenser was punctured by a fragment of flying metal and seventy-five persons in a crowded shelter suffered from inhaling the ammonia. Seven of them died. But no one wearing a gas mask, whether a member of a first aid party called in to help or a shelterer who had the sense to don his mask on the first experience of the acrid smell, suffered. In the pamphlet of instruction the Ministry of Home Security states that the gas masks, although not designed for the purpose, do afford some protection against ammonia. But it subsequently issued a warning on this point. Though they give some protection against the immediate danger from ammonia, when worn subsequently ammonia is liberated from the container in concentrations which may produce serious discomfort or even be dangerous. This effect occurs even when gas free air is drawn through the mask, and if it should occur in the presence of war gas the wearer is completely deprived of protection. He cannot wear the mask because of the ammonia given off as he breathes through the container and so will be exposed to the war gas. The gas mask should therefore not be relied on for protection against ammonia. If in an emergency it has to be worn while escaping from an area seriously contaminated with ammonia, a fresh container should be substituted for the old one as soon as possible.

The Influence of War on Surgery

In a lecture on the influence of war on surgery Mr. Zachary Cope said that surgery had always been an art but only recently a science. Up to the time of Harvey's discovery of the circulation of the blood it was a crude art, and for the most part surgeons learned their lessons on the battlefield. It was in the Franco-Prussian war of 1870 that antiseptics were given their first big trial. Modern wars were on so large a scale that they provided unparalleled opportunities for the trial of new remedies. The intensive research necessitated by the demands of war might concentrate within a year what would usually take ten years to do.

In the last great war the prevention of tetanus by specific serum was standardized and the treatment of shock and hemorrhage by blood transfusion made readily available. That war was also the chief means of putting thoracic surgery on its present sound foundation. Even more striking was the rapid and wonderful development of plastic surgery.

In the Spanish civil war the main advance was the discovery by Trueta that wounds treated by excision and encasement in plaster healed better than those treated by splinting and daily dressing. The present war had already provided important contributions to surgery. The work of Colebrook on the local anti-septic action of the sulfonamides and the experimental results of Zuckerman's researches on the effect of blast were noteworthy.

The Nutrition Society

The people of Britain have not allowed the war to prevent progress in many directions. Of this the latest example is the foundation of the Nutrition Society. Before the war the need for such a society was often discussed by workers on nutritional research, and a year ago informal meetings of about twenty representatives of the principal laboratories began. A provisional committee consisting of representatives of hospital schools, schools of agriculture and nutrition research laboratories, with Sir John Orr, F.R.S., as chairman, has been formed. About two hundred and thirty scientists who have been working on nutrition have been invited to become original members.

Of these about fifty are medical men and women. During the war the society will hold meetings at various research institutes. The first meeting has been held at Cambridge and was opened by an introductory address by Sir Gowland Hopkins, F.R.S. Louis Harris, A. M. Sinclair, John Yudkin and G. W. Robertson discussed "Assessment of the Level of Nutrition in Man"; B. S. Platt, R. H. Dobbs and W. C. W. Nixon, "Clinical Signs of Dietary Deficiency"; C. K. Crowther, H. H. Green and John Hammond, F.R.S., vice chairman of the society, "Nutrition of Farm Animals." An open discussion followed. The new society performs the valuable service of bringing into touch with one another workers in various fields. It has been difficult for the clinician to keep up with the advances of the biochemist or the agriculturist planning production to make full use of the knowledge of the dietitian for the community's needs. Here is the remedy.

Rose Hips as a Source of Vitamins

We are producing much more food by extending our agriculture. We are also turning attention to wild products not normally used in any quantity. Plans have been made by the Ministry of Health to harvest the vitamin wealth of our hedgerows in the form of the hips of the wild rose, which are particularly rich in vitamin C, twenty times richer than oranges. Their collection is being organized through schools, boy scouts, girl guides and women's institutes. The hips will be used to make a syrup for the benefit of adults as well as of babies and children. They will also be made into a purée, which will be converted into jam by the addition of sugar. According to a bulletin issued by the Children's Nutrition Council the purée should contain 160 to 600 mg. of ascorbic acid per hundred grams and the jam 130 to 230 mg. Thus there should be at least three 50 mg. doses of ascorbic acid in slightly over 3 ounces of jam. Half an ounce eaten daily with bread would provide a useful supplement to the vitamins obtained in the normal diet. It is interesting that rose hips are a traditional food of European peasants.

Anglo-Soviet Medical Cooperation

The formation of the Anglo-Soviet Medical Committee was reported in a previous letter. An executive committee formed to carry out the plans reports that twenty-six physicians have volunteered to help in translation from Russian. The Society for Cultural Relations with Russia has handed over all its medical literature to the committee. The task has arisen of advising lay organizations on the purchase of medical supplies for Russia. The committee will accept responsibility for giving such advice but will not be responsible for making purchases or arranging shipments. Welsh miners have raised \$300,000 for this purpose. Lord Dawson and Lord Horder suggested that the committee should work with the Red Cross in this matter. A subcommittee was appointed to explore the situation and give advice.

Reduction in Air Raid Casualties

The Ministry of Home Security announces the civilian casualties in air raids in September as 217 killed and 269 injured and detained in the hospital. A year ago the corresponding figures were 6,955 killed and 10,624 injured. For September 1941 the killed or missing numbered 87 men, 73 women, 45 persons under 16 and 12 unclassified. The number hospitalized included 129 men, 111 women and 29 persons under 16. In the first six months of 1941 18,698 persons were killed and 20,451 injured. The maximum number in one month was reached in April, when 6,131 were killed and 6,900 injured. The great reduction since that time is due mainly to a falling off in attacks from the air.

A Veteran Pediatrician

Sir Thomas Barlow, the eminent pediatrician, celebrated his ninety-sixth birthday on September 4. He is still up and about and is appreciative of the good wishes of his admirers.

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct. 18, 1941.

A New Face Reflex

A new face reflex is described by Austregésilo Filho of Rio de Janeiro. It is elicited by the percussion of the cheek. When positive, there is contracture of the orbicularis of the upper lip. This contracture may be on the same side (homolateral), both sides (bilateral) or opposite side (heterolateral). It is found in emotional patients without pathologic evidences and in psychoneurotic patients, in neurasthenia. When the reflex is absent on one side in patients with increased intracranial pressure it is suggestive of a lesion on the posterior fossa. The reflex also disappears on one side in cases of symptomatic trigeminal neuralgia.

Austregésilo has studied the condition for fifteen years and his conclusions are based on the examination of 500 patients.

Vaccination Against Tuberculosis

The administration of BCG vaccine against tuberculosis is widely practiced in the large Brazilian cities; even in many towns of the interior of the country its use is increasing constantly. In Pelotas, Rio Grande do Sul, whose population is estimated around 95,000 inhabitants, 78.86 per cent of newborn infants received BCG in 1940, while the rate for 5 years ago was only 25.30 per cent. The BCG service began here in 1933, when 3.97 per cent of the children were submitted to this form of immunization. The accompanying table demonstrates how widely this method of prevention has been accepted by the people:

Infants Who Received BCG

Year	Per Cent
1933	3.97
1934	14.26
1935	18.46
1936	25.30
1937	29.71
1938	33.33
1939	60.25
1940	78.86

Arlindo de Assis of Niteroi, Rio de Janeiro, who was the pioneer of BCG vaccination in Brazil, accomplished some researches on hyperallergic tuberculin tests following peroral immunization against tuberculosis. One hundred and forty-six infants and children aged from 2 months to 14 years were tested with old tuberculin by the Pirquet and Mantoux methods. None of them reacted to 2 mg. of tuberculin in intradermal injection. Roentgenologic research proved that none had pulmonary tuberculosis. Then they were given 200 mg. of living BCG a month, fasting in the morning. After twelve months 40 children (27.38 per cent) remained nonreactors to tuberculin in spite of the BCG vaccination; 6 other children (4.10 per cent) showed doubtful results of similar Mantoux tests; but 100 (68.52 per cent) became clearly hypersensitive to tuberculin. Although the reactivity was so high, clinical and roentgenologic examinations did not demonstrate any evidence of a virulent tuberculosis complicating BCG vaccination. The gastric contents of the principal reactors were injected into guinea pigs, which failed to acquire tuberculosis. The conclusion reached by Arlindo de Assis was that all changes occurring in the primarily nonreacting children, from the point of view of tuberculin hypersensitiveness, should depend on specific effects of the BCG bacilli, which would be absorbed by the gastrointestinal route. This hypersensitiveness decreases progressively.

Among factors which would have influenced such a result were (1) the high viability of the BCG vaccine as prepared in this country, (2) the comparatively high amount of BCG

bacilli introduced by mouth and (3) the fasting condition of the children at the time of their vaccination. Dr. Arlindo de Assis concludes that the oral route proved efficient. Occasional examples of specific hyperallergy caused by the oral use of BCG seem to afford definite evidence that a large amount of living bacilli can be absorbed by the gastrointestinal canal.

SWITZERLAND

(From Our Regular Correspondent)

Oct. 25, 1941.

Intoxications with Triorthocresyl Phosphate

Dr. R. Stachelin, professor of internal medicine and director of the medical clinic in Basel, reported to the Basel Medical Society 83 cases of poisoning with triorthocresyl phosphate. He recalled that around 1900 the same type of poisoning had occurred in treating tuberculosis with creosote phosphate. During 1929, 15,000 cases became known following the drinking of adulterated Jamaica ginger. These cases concerned chiefly old persons and some drunkards. The third series of such intoxications which have become known concerned attempts at abortion with apiol. The cases under consideration here were caused by mistaking triorthocresyl phosphate for a food oil in the preparation of cheese bread. In many cases an acute gastroenteritis developed one hour after eating; in a few cases protein was detected in the urine. After a short time the patients felt well again; after a latent period of from fourteen to twenty days however, 78 of the 83 patients had muscular pains and paralysis of the motor nerves, the peripheral groups of the arms and legs being most severely involved. In the later course, fibrillar twitching in the thighs and calves, prolonged erections, profuse sweating, headaches, insomnia, loss of hair and signs of incontinence were seen occasionally. All reflexes, with the exception of the achilles tendon reflex, were intact; the musculature of the abdomen and back functioned properly. Claw hand was observed. The severity of the symptoms was not dependent on the amount of the poison. Paralysis of the peroneus resulted in the "rooster step" walk. The internal organs were free from changes, except that there was an occasional increase in diastase values. All symptoms regressed. The treatment consisted chiefly in the administration of thiamine hydrochloride. The result was always the same, even in the patients who were treated with thiamine hydrochloride and strychnine (9 mg.). None of the patients died. Microscopic examination of the nerves revealed degeneration of the myelin sheaths (lipoid solubility); degeneration of the anterior horn was observed only in severe cases. Ophthalmologic examination disclosed that the visual disturbances, which developed in about one third of the cases, were chiefly the result of disturbances in accommodation and of the contraction of the vessels of the fundus oculi.

In the discussion that followed, it was brought out that the muscle groups which are most taxed during physical work (legs, right hand) were most severely involved in the poisoning.

Deaths

Dr. Adolpho Lutz, a descendant of an old Berne family, died in Rio de Janeiro. He was active in the field of tropical medicine and medical zoology and made special investigations on the transmission of tropical infectious diseases through insects. The Brazilian state of São Paulo recently founded in his honor the Adolpho Lutz Institute. Rio de Janeiro will found a museum of natural history which will bear his name.

Prof. Hermann Matti, appointed in 1938 as professor of surgery and director of the surgical clinic of the University of Berne, succeeding de Quervain, died aged 62 years. Matti successfully continued the illustrious tradition of Kocher and de Quervain, but in the spring of this year was obliged to retire because of ill health. Matti wrote a widely used textbook on fractures.

Deaths

William Hemphill Bell * Medical Director, Rear Admiral, United States Navy, retired, Chevy Chase, Md.; University of Pennsylvania Department of Medicine, Philadelphia, 1897; was appointed an assistant surgeon in the navy in 1898; was advanced through the various grades of the service; retired Jan. 1, 1936 on his own application with the rank of rear admiral; was head of the division of preventive medicine in the bureau of medicine and surgery; delegate to the second session of lectures of the International Bureau of Documentation on Military Medicine, Liège, Belgium, in 1932; first editor of the *U. S. Navy Medical Bulletin*, when it was established in 1907; member of the House of Delegates of the American Medical Association in 1907; fellow of the American College of Surgeons; aged 68; died, November 11, of cerebral arteriosclerosis and hypostatic pneumonia.

Albert Wynne Harris * Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1901; associate professor of neurology at his alma mater from 1909 to 1925, associate professor of clinical neurology and psychiatry from 1925 to 1927 and since 1927 professor of clinical neurology and psychiatry; was president of the Nashville Academy of Medicine; served with the Vanderbilt unit in France during the World War; member of the Southern Psychiatric Association; aged 63; died, December 7, of heart disease.

Andrew Porter Brown, Salina, Kan.; University of Kansas School of Medicine, Kansas City, 1932; member of the Kansas Medical Society; aged 32; first lieutenant in the medical reserve corps of the U. S. Army, serving as a flight surgeon at the Air Corps Gunnery School at Panama City, Fla., where he died, November 4, of infantile paralysis.

William Fero Cannon, Fayetteville, Tenn.; University of Nashville (Tenn.) Medical Department, 1892; Vanderbilt University School of Medicine, Nashville, 1892; member of the Tennessee State Medical Association; past president of the Lincoln County Medical Society; aged 72; died in November of injuries received in a fall.

Anthony Simon Maciejewski, Newark, N. J.; Temple University School of Medicine, Philadelphia, 1916; member of the Medical Society of New Jersey; served during the World War; assistant police surgeon; on the staff of St. James Hospital; aged 55; died, November 7, of carcinoma and cirrhosis of the liver.

Franklin W. Sol Raiter, Cloquet, Minn.; Milwaukee Medical College, 1911; member of the Minnesota State Medical Association; served during the World War; part owner of a hospital bearing his name; aged 52; died, October 2, of cerebral hemorrhage and hypertensive cardiovascular disease.

Samuel L. Carson, Vincennes, Ind.; Hospital College of Medicine, Louisville, Ky., 1898; member of the Indiana State Medical Association; formerly county coroner; aged 74; died, November 10, in the Presbyterian Hospital, Denver, of hypertrophy of the prostate and auricular fibrillation.

Archibald Buchanan, Troy, N. Y.; Albany Medical College, 1895; member of the Medical Society of the State of New York; for many years county coroner; served during the World War; aged 75; died, November 16, of coronary sclerosis and generalized arteriosclerosis.

William F. Chenoweth, Nogales, Ariz.; Medical College of Ohio, Cincinnati, 1888; past president of the state board of medical examiners; member of the Arizona State Medical Association; aged 76; died, August 20, in Santa Barbara, Calif., of carcinoma of the right lung.

Maurice Joseph Lippman * New York; University and Bellevue Hospital Medical College, New York, 1907; assistant, allergy clinic, New York Post-Graduate Medical School; aged 56; died, October 31, in the Beth Israel Hospital of hemangiosarcoma with metastasis.

Benjamin Cyrus Bell, Santa Monica, Calif.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1898; fellow of the American College of Surgeons; aged 71; died, September 3, of cerebral hemorrhage, arteriosclerosis and chronic myocarditis.

George S. Henderson * Holcomb, Ill.; College of Physicians and Surgeons of Chicago, 1895; past president of the Ogle County Medical Society; aged 77; died, November 4, in the Swedish American Hospital, Rockford, of coronary thrombosis.

Arthur Paul Maloney, Fonda, Iowa; John A. Creighton Medical College, Omaha, 1910; member of the Iowa State Medical Society; past president and secretary of the Pocahontas County Medical Society; aged 59; died, October 24, of uremia.

Joseph C. Kugler, Jackson, Mich.; Medical College of Ohio, Cincinnati, 1886; member of the Michigan State Medical Society and the American College of Radiology; aged 79; died, November 23, in the W. A. Foote Memorial Hospital.

George Washington Duncan * Iberia, Mo.; Washington University School of Medicine, St. Louis, 1908; past president of the Miller County Medical Society; aged 62; died, November 3, in St. Mary's Hospital, Jefferson City, of pneumonia.

William Max Fearon * Los Angeles; College of Physicians and Surgeons, Los Angeles, 1913; served during the World War; aged 52; died, November 11, in the Methodist Hospital of Southern California of coronary thrombosis.

Arthur Clinton McKenney, Los Gatos, Calif.; College of Physicians and Surgeons of San Francisco, 1908; formerly assistant clinical professor of medicine at the Stanford University School of Medicine; aged 71; died, October 4.

John George Frederick Holston * Zanesville, Ohio; Jefferson Medical College of Philadelphia, 1903; president of the Muskingum County Academy of Medicine in 1927; aged 62; died, November 2, of myocardial degeneration.

Anton Otto Frana, Chicago; Jenner Medical College, Chicago, 1917; member of the Illinois State Medical Society; served during the World War; on the courtesy staff of the Evangelical Hospital; aged 56; died, November 18.

Wallace Longfellow Meyers, Livermore, Calif.; University of California Medical School, San Francisco, 1909; aged 60; died, August 12, in the Lane Hospital, unit of Stanford University, San Francisco, of nontropical sprue.

Eli George Davis, Lewistown, Ill.; Kentucky School of Medicine, Louisville, 1881; member of the Illinois State Medical Society; aged 88; died, November 11, in the Graham Hospital, Canton, of hypostatic pneumonia.

William John Reed, Los Angeles; University of Southern California College of Medicine, Los Angeles, 1906; aged 66; died, October 10, in the Queen of Angels Hospital of coronary occlusion and essential hypertension.

James Carson Fountain, Columbus, Ohio; Starling Medical College, Columbus, 1906; served during the World War; on the staff of the White Cross Hospital; aged 63; died, November 3, of heart disease.

Robert Mayrand, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1901; served during the World War; formerly professor of dermatology at his alma mater; aged 64; died, October 7.

Moss Young Allen, Mount Airy, N. C.; Medical Department of Tulane University of Louisiana, New Orleans, 1898; aged 68; died, October 31, at the Martin Memorial Hospital of cerebral hemorrhage.

Tandy Allen Hughes, Denver; St. Louis Medical College, 1883; at one time secretary-treasurer of the state board of medical examiners; aged 81; died, November 2, in St. Joseph's Hospital of pneumonia.

William Henry Garrison, Clarksville, Ga.; Atlanta School of Medicine, 1909; member of the Medical Association of Georgia; aged 57; died, November 10, in the Downey Hospital, Gainesville.

Charles Leidy Bossert * Atlantic City, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1908; served during the World War; aged 68; died, November 13, of heart disease.

John Reid Edwards, Madison, Wis.; Medical College of Virginia, Richmond, 1940; resident, State of Wisconsin General Hospital; aged 25; was killed in November in an automobile accident.

Artemas W. Chase * Adrian, Mich.; Detroit College of Medicine, 1900; formerly mayor; served during the World War; on the staff of the Bixby Hospital; aged 66; died, November 7.

Frank W. Lee * Osage, Iowa; State University of Iowa College of Homeopathic Medicine, Iowa City, 1887; aged 82; died, October 28, in the Cedar Valley Hospital, Charles City, of uremia.

James L. Bow, Whitewright, Texas; Louisville (Ky.) Medical College, 1893; member of the State Medical Association of Texas; aged 76; died, November 4, at Wichita Falls.

William Erastus Judson, Livermore, Calif.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; aged 63; died, August 10, in Oakland of uremia.

Shelton Idolia Colvin, Gibsland, La.; Memphis (Tenn.) Hospital Medical College, 1891; aged 73; died, September 5, of injuries received when he was struck by a truck.

Elzora Butler Allen, Raymond, Calif.; Woman's Medical College of Pennsylvania, Philadelphia, 1904; aged 67; died in September in a hospital at Madera of carcinoma.

Leon Octave Noel, Sherbrooke, Que., Canada; Laval University Faculty of Medicine, Quebec, 1883; aged 82; died, October 15, in the Hopital Notre-Dame, Montreal.

Frank P. Head, Gallatin, Tenn.; Vanderbilt University School of Medicine, Nashville, 1898; aged 65; died, November 4, of cerebral hemorrhage and arteriosclerosis.

Edward Ferris Holbrook, San Francisco; Cooper Medical College, San Francisco, 1893; member of the California Medical Association; aged 69; died, October 9.

John H. Lowery, San Diego, Calif.; University of Louisville (Ky.) Medical Department, 1894; aged 68; died, October 3, of diabetes mellitus and arteriosclerosis.

Joseph Domenic Reeng, San Francisco; Cooper Medical College, San Francisco, 1909; member of the California Medical Association; aged 54; died, October 28.

Joseph Ridgway, Minneapolis; Minneapolis College of Physicians and Surgeons, 1894; died, October 29, of arteriosclerosis and myocardial insufficiency.

Allister McDonald Murray, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1908; died, October 29, in the Toronto East General Hospital.

Lawrence Hobbs Acres, Los Angeles; Stanford University School of Medicine, San Francisco, 1930; aged 38; died, August 21, of upper respiratory infection.

William Clarence Doyle, Windsor, Ont., Canada; Western University Faculty of Medicine, London, 1901; at one time mayor of Essex; died, September 17.

Melvin McKinley Lofton ☉ Philadelphia; Howard University College of Medicine, Washington, D. C., 1922; aged 44; died, October 7, of heart disease.

Morris Fink ☉ New York; Columbia University College of Physicians and Surgeons, New York, 1906; aged 59; died, October 31, of coronary thrombosis.

Wendell H. Priest, Mitchell, Neb.; John A. Creighton Medical College, Omaha, 1910; aged 58; died, October 26, in the Fairacres Hospital, Scottsbluff.

William Moore White, Lenoir, N. C.; Atlanta (Ga.) College of Physicians and Surgeons, 1899; formerly county health officer; aged 80; died, October 31.

Joseph Walter Kean, Los Angeles; Jefferson Medical College of Philadelphia, 1906; aged 57; died, August 30, of coronary occlusion and arteriosclerosis.

Albert C. Buell, Cleveland; Homeopathic Hospital College, Cleveland, 1880; aged 90; died, November 10, of bronchopneumonia and coronary sclerosis.

Alonzo Graves, Russellville, Ala.; Marion-Sims College of Medicine, St. Louis, 1899; veteran of the Spanish-American War; aged 67; died in October.

William Wright McEwen, San Diego, Calif.; St. Louis College of Physicians and Surgeons, 1883; aged 87; died, September 4, of coronary occlusion.

John Riley Hughes ☉ Milwaukee; Rush Medical College, Chicago, 1912; served during the World War; aged 55; died, October 26, in Oakland, Calif.

Epaenetus Luther Trimmer ☉ Los Angeles; Jefferson Medical College of Philadelphia, 1897; aged 78; died, August 13, of aortic regurgitation.

Archie E. Carder, Coweta, Okla.; Beaumont Hospital Medical College, St. Louis, 1901; aged 77; died, October 30, of carcinoma of the prostate.

Norman Beard Noll, Mercer, Pa.; Jefferson Medical College of Philadelphia, 1902; aged 63; died, October 29, in New York of cerebral hemorrhage.

Carl S. Gunther Nagel, San Francisco; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1881; aged 83; died, October 27.

Alexander Franklin Brown, Fort Sumner, N. M.; Vanderbilt University School of Medicine, Nashville, Tenn., 1890; aged 82; died, October 8.

John Rollin Harrison, La Porte, Texas; College of Physicians and Surgeons, Keokuk, Iowa, 1892; aged 83; died, November 5, in Houston.

Will Sayer Moffatt, Los Angeles; Hahnemann Medical College and Hospital, Chicago, 1868; aged 94; died, September 12, of arteriosclerosis.

Harvey Milton Mayer, Los Angeles; Medico-Chirurgical College of Kansas City, Mo., 1905; aged 67; died, August 17, of ventricular fibrillation.

William Silas Hewitt, Cincinnati; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; aged 72; died, November 9.

Moses Krakowski ☉ New York; University of Kharkov Faculty of Medicine, Russia, 1894; aged 74; died, October 31, of coronary occlusion.

Hammond Johnson McCallum, Azusa, Calif.; University of California Medical Department, San Francisco, 1895; aged 71; died, October 15.

Madeline E. Johns, San Francisco; University of California Medical Department, San Francisco, 1903; aged 72; died, September 10.

Matthew Francis Desmond, Burney, Calif.; University of California Medical School, San Francisco, 1923; aged 47; died, August 10.

Robert Lee Fulcher, Blanco, Texas; University of Tennessee Medical Department, Nashville, Tenn., 1897; aged 72; died, October 1.

Gordon Edward Helston, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1922; aged 41; died, October 14.

John William Haines, Croton, Ohio; Starling Medical College, Columbus, 1896; aged 70; died, November 4, of myocarditis.

William S. Ambler, Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1893; aged 79; died, October 15.

Richard C. Cartwright, Kingston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1884; aged 79; died, October 20.

Edgar Moses Brundage, Chaplin, Sask., Canada; Baltimore Medical College, 1896; also a dentist; aged 79; died, October 2.

Richard A. Stark, Chicago; Jenner Medical College, Chicago, 1908; served during the World War; aged 55; died in October.

Frank Webster Terwilliger, Highland, N. Y.; Dartmouth Medical School, Hanover, N. H., 1896; aged 71; died, October 31.

Owen Abner Buck Ames, Fairfield, Maine; Dartmouth Medical School, Hanover, N. H., 1898; aged 65; died, November 9.

William Axel Johnson, Santa Cruz, Calif.; Chicago College of Medicine and Surgery, 1916; aged 70; died, August 31.

James Albert Ghent, San Francisco; Trinity Medical College, Toronto, Ont., Canada, 1889; aged 72; died, September 1.

Charles Wilbur Monroe ☉ Cincinnati; University of Cincinnati College of Medicine, 1934; aged 40; died, November 4.

Joseph Franklin De Castro, Brooklyn; Bellevue Hospital Medical College, New York, 1885; aged 81; died, November 2.

Melvin Clinton Kimball Sr., Tulsa, Okla.; American Medical College, St. Louis, 1908; aged 61; died, November 2.

James Edward McCue, San Francisco; Cooper Medical College, San Francisco, 1901; aged 73; died, October 30.

Henry Edgar Vreeland, Los Angeles; Rush Medical College, Chicago, 1891; aged 86; died, October 24, of senility.

Paul Heron Reilly ☉ Vallejo, Calif.; Cooper Medical College, San Francisco, 1901; aged 77; died in October.

Joseph Crane Kessler, Hamlin, W. Va.; Illinois Medical College, Chicago, 1908; aged 67; died, October 28.

William Lustig, New York; Long Island College Hospital, Brooklyn, 1906; aged 57; died, October 29.

James P. Atkinson, Bodcaw, Ark. (licensed in Arkansas in 1903); aged 80; died, October 11, of carcinoma.

Charles Henry Buchanan, Chicago; Rush Medical College, Chicago, 1876; aged 90; died, November 12.

Bureau of Investigation

EDWARD S. HIDDEN AND SOME FAKES "Tonic," Obesity "Cure" and Hair "Grower" Subjects of Federal Actions

Edward S. Hidden of New York first came to the attention of the Bureau of Investigation in March 1939 as a shipper of a nostrum, "Vitatic," which was seized in interstate commerce by the Food and Drug Administration. The shipment was found to be a violation of the national Food and Drugs Act because of false and fraudulent representations on the labels. Among these were that the product was a "body builder . . . wonderfully efficient for rundown people . . . will tone up your entire system by bringing about the proper coordination of your stomach, liver, kidneys and bowels and by supplying your body with the necessary essentials it now lacks. . . ." Government chemists reported that Vitatic consisted essentially of extracts of plant drugs including nux vomica and an emodin-bearing drug (not named), with alcohol (14.4 per cent by volume) and water. As no claimant appeared, judgment of condemnation was entered and the product ordered destroyed. The resulting Notice of Judgment (No. 29764) was briefly abstracted in THE JOURNAL, Dec. 9, 1939, page 2168.

Following the confiscation an information detailing the nature of the violation was directed against Edward S. Hidden and the case was transmitted to the United States Attorney General for consideration. Subsequently at the trial in New York City in September 1940 a jury found Hidden guilty on three counts and he was fined \$600, from which verdict he filed an appeal, it was reported. The judge's charge to the jury was said to have been particularly strong. It was reported also that Hidden had been convicted in New York of violating the sanitary code for having in his possession and for sale an unregistered "patent medicine" and a harmful drug; that he was sentenced to six months imprisonment and served two and a half months of this sentence before being released on bail after filing an appeal, which is said to be still pending.

The Post Office Department was the next government agency to look into one of Hidden's schemes. This was the mail order sale of a "fat cure," variously known as "Slim-A-Lax" and "Tab Thins" and represented to reduce excess weight safely, quickly and easily without diet or exercise and regardless of the cause of the obesity. According to a government chemist, it consisted of pink-coated tablets, each essentially a mixture of ginger, podophyllin, aloin, cascara and small amounts of strychnine and belladonna. As an expert medical witness for the government pointed out, its effect was a laxative one. In other words, it was one of the pernicious treatments that reduce weight by hurrying the food through the system before it can be assimilated. Further, it was shown that Hidden's nostrum was not "absolutely safe and harmless" as claimed. He presented no defense either in person or through any representative, and a fraud order was issued on Oct. 25, 1940 against the names under which he had operated the scheme: Madison Chemical Company, Tab Thins Company, Slim-A-Lax Company, Riverside Chemical Company and C. N. Talcott.

Meantime the Post Office had been investigating another mail order activity of Edward S. Hidden. This was an alleged baldness cure called "Nuhair," in the sale of which he did business under his own name, also as C. J. Walton, Nuhair Company and Nu Hair Company. The Post Office charged that Hidden represented that Nuhair was a scientific discovery, that when used as directed it would produce a full growth of hair even when the user was "as bald as a billiard ball" and that it would overcome various scalp disorders. The usual testimonials, of course, were employed as part of the promotional scheme. At the hearing of the case it was brought out that, according to the Nuhair label, the product contained water, sulfonated castor oil, kerosene, 60 per cent of alcohol and 0.1 per cent of beta naphthol, and a government chemist's analysis confirmed this composition. An expert medical witness for the government testified that the ingredients of Nuhair are not new but have been commonly used in hair treatments and their actions and

limitations are well known; that baldness may be due to many systemic causes not affected by any type of treatment, and that Nuhair was worthless as a hair grower. On Jan. 28, 1941 a fraud order was issued which debarred from the mails the business conducted by Edward S. Hidden, C. J. Walton, the Nuhair Co., Nu Hair Company, and their officers and agents, none of whom had appeared or put up a defense at the hearing of the case.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Absorbine, Jr.—In March 1941 the Federal Trade Commission accepted from W. F. Young, Inc., Springfield, Mass., a stipulation in which this concern promised to discontinue the following misrepresentations in the sale of its products: That "Absorbine, Jr." can kill such fungi of athlete's foot as are buried beneath the corneous layer of the skin, have any effect on tissues deeper than those supplied by the peripheral vascular system, or that accepted laboratory tests have proved that it achieves such results. Nearly four years previously (June 1937) the Young concern had stipulated with the Federal Trade Commission that it would no longer advertise Absorbine, Jr. as a treatment for insomnia.

Mothersill's Seasick Remedy.—This is put out by a Ferd. T. Hopkins, trading as Ferd. T. Hopkins and Son, New York. In March 1941 he signed a stipulation with the Federal Trade Commission in which he agreed to cease advertising that the product will prevent or stop travel sickness or assure travel comfort. When analyzed in the American Medical Association's Chemical Laboratory a good many years ago, the treatment was found to consist of capsules whose chief potent ingredient was chlorobutanol.

Rumagol.—This is put out by one A. Medrano, Los Angeles, trading as the Rumagol Laboratories, Rio Grande Pharmacy and Rio Grande Drug Company. In March 1941 Medrano entered into a stipulation with the Federal Trade Commission in which he promised to cease making these misrepresentations for "Rumagol": That it is an effective treatment or analgesic for rheumatoid arthritis, muscular pains, lumbago, sciatica, gout, neuritis, arteriosclerosis, painful or twisted joints or nerves or so-called rheumatism, that competing products are ineffective in the treatment of such ailments or that the preparation will reduce and eliminate excess uric acid by its action on the kidneys. Medrano further agreed to discontinue advertisements which fail to reveal that Rumagol should not be used when abdominal pain, nausea, vomiting or other symptoms of appendicitis are present or that frequent or continued use of the product may result in dependence on laxatives.

Schenck's (Dr.) Mandrake Pills.—J. H. Schenck and Son, Inc., Philadelphia, promised the Federal Trade Commission in March 1941 that it would discontinue advertisements which fail to reveal that these pills should not be used when abdominal pain or other symptoms of appendicitis are present or that frequent or continued use of the product may result in dependence on laxatives.

Thymo Borine.—In March 1941 the Thymo Borine Laboratory, Milwaukee, stipulated with the Federal Trade Commission that it would no longer advertise that this alleged mouth wash, deodorant and antiseptic purifies the breath, mitigates inflammation of the mouth resulting from artificial teeth and stops perspiration odors or foot odors; that it is a competent treatment for itching scalp or itching skin due to bites, poisons, hives or athlete's foot and is an effective germicide when used as a gargle.

Vimm Products.—Mariano Pollina of New York for a time operated as Vimm Wheat Germ Products Company and Moderno Company, distributing alleged health food products. In March 1941 he signed a stipulation with the Federal Trade Commission stating, among other things, that he had sold his interest in the two trade names and the food products to a corporation. He agreed that, should he ever resume the advertising and sale of these products, he would not in any way represent that "Vimm's Wheat Germ Oil Capsules" will assure good health or normalize, strengthen, revive or prolong reproductive functions; that "Vimm's Wide Wheat Germ" is the world's richest natural source of vitamins B, E and G, a good source of vitamins A and C and is concentrated with iron, copper, potassium, magnesium and manganese or any of these elements; that "Fertile Palm Co." will prevent tooth decay, premature aging, nervousness, acidity and is essential for growing children and pregnant women or that "Plain Palm Co." assures digestive vigor, is a perfect natural food containing the greatest possible concentration of vital factors from plants in digestible form.

Correspondence

SURGICAL VS. MEDICAL TREATMENT OF HYPERTENSION

To the Editor:—The paper by Woods and Peet (*THE JOURNAL*, November 1, p. 1508) needs careful study and perhaps additional comment in order to emphasize certain points. The important question is whether or not to recommend surgical treatment for patients with hypertension. Both in their own series and in the series of Wagener and Keith from the Mayo Clinic which they use for comparison, the percentage of cases classified as group 4 (malignant hypertension) is much higher than that found in private practice. Their own series is stated to be 32 per cent and the Mayo group 67 per cent. To a great extent, therefore, they are not discussing the kind of cases that comprise most of the cases of hypertension seen in private practice.

The majority of patients with hypertension seen in private practice have a moderately high blood pressure and a moderate degree of arteriosclerosis of the retinal vessels and would fall into their group 2. One must be particularly impressed, therefore, that their surgical results in this group are the same as the medical results as far as mortality is concerned.

From a practical point of view, then, the survival of patients with the most common form of hypertension with which the practitioner deals is not influenced by this form of surgical treatment.

In their group 3 it seems questionable whether they are talking about the same kind of patients as those in the Mayo series. They do not attempt to differentiate between patients who have arteriosclerosis of the retinal vessels and those who have simply angiospasm, and yet it is obvious that this is an important difference as far as end results of any treatment is concerned. Moreover, in the revision of the classification which they offer they do not attempt any differentiation within this group as far as arteriosclerosis and angiospasm are concerned. When a patient with hypertension has arteriosclerosis of the retinal vessels, especially if it is pronounced, it is an indication of long-standing hypertension with probable changes in vital organs due to corresponding arteriosclerotic changes.

Therefore, one may question whether the comparability of group 3 has been established for the two series of cases. This in turn affects the evaluation of mortality. Moreover, when one compares their table 4 B, which has to do with mortality, with table 1, one finds that in this same group 3 the Mayo Clinic had a percentage of only 17 females while they had 43, and it is well recognized that women tolerate hypertension better than men.

It is their group 4 (cases of papilledema) in which noteworthy therapeutic results seem to have been achieved. If their cases in this group correspond to the Mayo group 4 and do not include cases of acute angiospastic hypertension, which sometimes subside spontaneously, then surgery of at least this form of hypertension is amply justified.

The last point is one to which I have called attention before, and that is the fallacy of judging symptomatic relief following operation as a criterion to justify operation, when blood pressure figures and other objective evidences have not been influenced. It is obvious that this is no criterion at all and by no means constitutes an indication of the value of surgery as opposed to medicine. Many therapeutic procedures besides surgery may bring about symptomatic relief in hypertensive patients.

May I offer the following classification of retinal changes from the standpoint of judging therapeutic results, if that is to be the only criterion:

1. Normal.
2. Arteriosclerosis without angiospasm.
3. Angiospasm without arteriosclerosis.
4. Both arteriosclerosis and angiospasm
 - (a) with no evidence of active retinitis and
 - (b) with evidence of active retinitis (hemorrhages and exudates).
5. Arteriosclerosis, angiospasm, retinitis and papilledema.

This is the first thorough effort of which I know to compare results of medical and surgical treatment by a long time follow-up of a number of carefully studied cases and for that reason deserves a great deal of credit.

EDWARD WEISS, M.D., Philadelphia.

[NOTE.—The letter of Dr. Weiss was referred to Dr. Max Peet, whose reply follows:]

To the Editor:—May we first express our appreciation to Dr. Weiss for the keen interest he has shown in our paper and for his penetrating criticisms, indicating a thorough knowledge of the therapeutics of hypertension.

The question is not at all a matter of "surgical versus medical treatment of hypertension" but rather of determining the point in the progress of the disease when surgical treatment should be called on to replace accepted medical treatment which has failed. In confirmation of this point of view may we agree with the author that we do not see "the kinds of patients who comprise most of the cases seen in private practice" but instead are asked to treat those patients who have not gained relief after a thorough trial of medical treatment. The term "versus" arises only when persistent medical therapy has proved inadequate for too long and has allowed irreversible damage to occur to the patient. It should be pointed out that to expect the neurologic surgeon to relieve the hypertension in such a case is exactly the same as to ask the general surgeon to operate on a patient whose appendix has been allowed to rupture.

In order to obviate the criticism that our cases in group 3 were not the same type as those in the Mayo series we have, in our article, presented a careful analysis of these cases and have, in addition, had assurance from Dr. Keith that they were correctly placed in group 3. We feel, therefore, that this criticism is unjustified.

To proceed to the next point of criticism, our statistics with regard to the difference in mortality between the sexes are misquoted. The correct figures for group 3 are: In table 1 (number and sex of patients) the percentage of males in the Mayo series is 58, in our series 33½; the percentage of females in the control series is 42, in ours 66%. (The figures quoted by the author of the letter are for total percentages, not for each sex). Regardless of this error, the argument that the two series are not comparable because we include more females is still tenable, provided the statement is true that "it is well recognized that women tolerate hypertension better than men." In anticipation of this criticism we have pointed out in our original article that "careful analysis of table 4 B demonstrates a relatively small difference in mortality between the two sexes in the control group." Actual figures for group 3 show no difference in mortality, revealing a 91 per cent mortality for males and a 93 per cent mortality for females in the control series as against a 36 per cent male and a 36 per cent female mortality in our series. The conclusion, therefore, should be reached that the idea that women in this group tolerate hypertension better than males must be revised and, for that reason, it must also be concluded that our mortality statistics can accurately be compared with those of the control series.

We should like to assure the author that our group 4, as stated in our article, includes only, by definition, those patients with papilledema. Patients with "acute angiospastic hypertension" without papilledema were not included in group 4.

We must disagree with the statement that symptomatic relief following operation "is no criterion at all." Although we state in our paper that "we have not emphasized symptomatic relief following operation," and we fully realize the difficulty in evaluating such relief after therapy, still to us the large percentage of patients (approximately 85) who did gain benefit symptomatically is of definite significance. This significance becomes greater when it is realized that the majority of these patients came because of symptoms which were unrelieved by accepted medical treatment.

The suggested classification of retinal changes is a good one. We shall not discuss its merits and shortcomings here, since we have a paper about to be published in which we discuss the great need for a standardized method of pretherapeutic classification and post-therapeutic evaluation of results and include a newly proposed classification of the retinal changes in hypertension which incorporates the modifications suggested in the letter.

MAX M. PEET, M.D.

WARD W. WOODS, M.D.

Ann Arbor, Mich.

ON THE ENZYMATIC HYPOTHESIS OF RADIOSENSITIVITY

To the Editor:—An editorial comment (*THE JOURNAL*, September 20, p. 1020) discussed some observations by W. M. Dale: The Effect of X-Rays on Enzymes, *Biochem. J.* **34**:1367 [Nov.] 1940) on the roentgen inactivation of purified enzymes in dilute solution. Under these conditions a large fraction of the activity of the specimen could be destroyed by doses of radiation even smaller than those used in radiotherapy.

The hypothesis that cellular damage produced by roentgen rays may be a consequence of the inactivation of intracellular enzymes has recently been regarded as untenable because of the enormous doses required for inactivation in experiments with crude concentrated enzyme preparations. The results of Dale with purified enzymes have again brought forth the suggestion that enzyme destruction in cells may after all play a part in determining the sensitivities of different tissues to roentgen rays.

In this connection it is interesting to consider some observations by us (Luria, S. E., and Exner, F. M.: The Inactivation of Bacteriophages by X-Rays: Influence of the Medium, *Proc. Nat. Acad. Sc.* **27**:370 [Aug.] 1941) on the roentgen inactivation of bacteriophages suspended in different mediums. These observations suggest an explanation of Dale's results, but at the same time they bring renewed doubt as to whether enzyme inactivation by roentgen rays can take place in living cells to an appreciable extent.

In the action of roentgen rays on bacteriophages, two distinct mechanisms were found and were interpreted one as an indirect and the other as a direct effect of the radiation. In dilute water and saline suspensions relatively small doses of radiation inactivate large amounts of bacteriophage. This effect appears to be due to an inactivating agent produced by roentgen rays in the medium. Among other reasons for this interpretation is the fact that the effect depends on the composition of the medium. The presence of small amounts of foreign proteins (suspensions in broth or in water solutions of gelatin, albumin and the like) greatly increase the resistance of bacteriophages. The presence of foreign proteins protects the bacteriophage presumably by competing with it in reacting with the agent produced in the medium by roentgen rays. A mere screening effect can be excluded on the basis of the known mechanism of roentgen absorption.

With large doses of roentgen rays—far larger than any used in therapy—bacteriophage is inactivated even in the presence of proteins. The characteristics of this inactivation process, in contrast with those of the effect in water or saline solution, indicate that it is a direct effect of the radiation on the bacteriophage particles.

There is published evidence that at least some other viruses in their sensitivity to roentgen rays follow a pattern similar to that observed with bacteriophages (Syverton, J. T.; Berry, G. P., and Warren, S. L.: The Roentgen Irradiation of Papilloma Virus (Shope): II. The Effect of X-Rays upon Papilloma Virus in Vitro, *J. Exper. Med.* **74**:223 [Sept.] 1941. Friedewald, W. F., and Anderson, R. S.: Influence of Extraneous Protein and Virus Concentration on the Inactivation of the Rabbit Papilloma Virus by X-rays, *ibid.* **74**:463 [Nov.] 1941).

The inactivation of enzymes in pure and in crude preparations can easily be interpreted in terms of the behavior of viruses as just outlined. The action of roentgen rays on enzymes in pure preparations, as observed by Dale, is doubtless an indirect effect, as indicated by its dependence on concentration. Earlier observations (Hussey, R. G., and Thompson, W. R.: The Effect of Radioactive Radiation and X-Rays on Enzymes: I. The Effect of Radiation from Radium Emanations on Solutions of Trypsin, *J. Gen. Physiol.* **5**:647 [May] 1923. Clark, H., and Northrop, J. H.: The Inactivation of Trypsin by X-Rays, *ibid.* **9**:87 [Sept.] 1925) on trypsin can readily be accounted for by the same mechanism. Moreover, the high resistance of the proteolytic enzymes studied by Dale, when acting on their substrates, may easily be interpreted as due to the protecting action of proteins.

Though it may seem paradoxical, the more a virus or an enzyme is purified the more the direct effect of radiation is overshadowed by the indirect and the more radiosensitive the material appears to be. In the case of enzymes, it is unlikely that a direct effect of radiation has ever been observed. If existing, it would probably become observable only with doses of several million roentgens, on account of the small molecular size of enzymes.

In view of the evidence presented here, it is difficult to accept the indirect action of roentgen rays on enzymes, as observed by Dale with purified material, as an explanation of the radiosensitivity of cells. As pointed out by Friedewald and Anderson in another connection, protoplasmic fluid, being rich in protein, would be expected to protect enzymes from the inactivating agent produced in water by roentgen rays. Only through some other process as yet unrecognized could enzymes in tissues be inactivated by therapeutic doses of roentgen rays.

S. E. LURIA, M.D.

FRANK M. EXNER, M.A.

New York.

PHONOGRAPHIC RECORDS OF HEART SOUNDS

To the Editor:—My attention has been called to an editorial comment in *THE JOURNAL*, October 18, which speaks of Dr. Geckeler's reproductions of heart sounds on phonographic records. You make the statement that he "no doubt conceived the technic." I thought that you might be interested in knowing that we have on file at the Army Medical Museum records of heart sounds prepared and deposited with us by Dr. Benjamin Manchester of Washington, D. C., in 1939. I understand that Dr. Geckeler knew of these records.

J. E. ASH, Colonel, Medical Corps, U. S. Army;
Curator, Army Medical Museum, Washington, D. C.

Medical Examinations and Licensure**COMING EXAMINATIONS AND MEETINGS****ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE**

CHICAGO, Feb 16 17, 1942 Council on Medical Education and Hospitals, Sec, Dr William D Cutter, 535 North Dearborn Street, Chicago

MEDICAL CORPS UNITED STATES NAVY

Examination Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan 5 9 Examination will be held at the Naval Hospitals at Chelsea, Mass, Newport, R I, Brooklyn, Philadelphia, Norfolk, Va, Charleston, S C, Pensacola, Fla, Corpus Christi, Tex, San Diego and Mare Island, Calif, Puget Sound, Wash, Great Lakes, Ill, Pearl Harbor, T H, and Naval Medical Center, Washington, D C Apply Bureau of Medicine and Surgery, Navy Department, Washington, D C

**NATIONAL BOARD OF MEDICAL EXAMINERS
EXAMINING BOARDS IN SPECIALTIES**

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, December 13, page 2096

BOARDS OF MEDICAL EXAMINERS

ALABAMA Montgomery, June 16 18 Sec, Dr B T Austin, 519 Dexter Ave, Montgomery

ARIZONA * Phoenix, Jan 6 7 Sec, Dr J H Patterson, 826 Security Bldg, Phoenix

COLORADO * Endorsement Denver, Jan 6 Examination Denver, Jan 7 9 Applications must be on file not later than Dec 22 Sec, Dr George R Buck, 831 Republic Bldg, Denver

CONNECTICUT * Medical Examination Hartford, March 10 11 Endorsement Hartford, March 24 Sec to the Board, Dr Creighton Barker, 258 Church St, New Haven Homeopathic Derby, March 10 11 Sec, Dr Joseph H Evans, 1488 Chapel St, New Haven

DELAWARE Dover, July 14 16 Sec, Medical Council of Delaware, Dr Joseph S McDaniel, 229 S State St, Dover

FLORIDA * Jacksonville, June 22 23 Sec, Dr William M Rowlett, Box 786, Tampa

GEORGIA Atlanta June Sec, State Examining Boards, Mr R C Coleman, 111 State Capitol, Atlanta

HAWAII Honolulu, Jan 12 15 Sec, Dr James A Morgan, 48 Young Bldg, Honolulu

IDaho Boise, Jan 13 Dir, Bureau of Occupational License, Mr Walter Curtis 355 State Capitol Bldg, Boise

ILLINOIS Chicago, Jan 20 22 Superintendent of Registration, Mr Philip M Harman, Department of Registration and Education, Springfield

INDIANA Indianapolis, June 16 18 Sec, Board of Registration and Examination, Dr J W Bowers, 301 State House, Indianapolis

IOWA * Des Moines, Jan 15 17 Dir, Division of Licensure and Registration State Department of Health, Mr H W Greffe, Capitol Bldg, Des Moines

MAINE Portland, March 10 11 Sec, Board of Registration of Medicine, Dr Adam P Leighton, 192 State St, Portland

MASSACHUSETTS Boston, March 10 13 Sec, Board of Registration in Medicine, Dr Stephen Rushmore 413 F State House, Boston

MICHIGAN * Ann Arbor and Detroit, June 10 12 Sec Board of Registration in Medicine, Dr J Earl McIntyre, 202 4 Hollister Bldg, Lansing

MINNESOTA * Minneapolis, Jan 20 22 Sec, Dr Julian F Du Bois, 230 Lowry Medical Arts Bldg, St Paul

MISSISSIPPI Reciprocity Jackson December Asst Sec, State Board of Health, Dr R N Whitfield, Jackson

MONTANA Helena, April 7 8 Sec, Dr Otto G Klein, First National Bank Bldg Helena

NEW HAMPSHIRE Concord March 12 13 Sec, Dr T P Burroughs, Board of Registration in Medicine, State House, Concord

NEW JERSEY Trenton, June 16 17 Sec, Dr Earl S Hallinger, 28 W State St, Trenton

NEW MEXICO * Santa Fe, April 13 14 Sec, Dr Le Grand Ward 135 Sena Plaza, Santa Fe

NORTH CAROLINA Endorsement December Sec, Dr W D James, Hamlet

NORTH DAKOTA Grand Forks Jan 6 9 Sec, Dr G M Williamson, 4 1/2 S Third St, Grand Forks

OREGON Portland, Jan 21 23 Exec Sec, Miss Lorette M Conlee, 608 Lailing Bldg, Portland

PENNSYLVANIA Philadelphia, Jan 6 10 Acting Sec Bureau of Professional Licensing, Mrs Marguerite G Steiner, 358 Education Bldg, Harrisburg

RHODE ISLAND * Providence Jan 8 9 Chief Division of Examiners, Mr Thomas B Casey, 366 State Office Bldg, Providence

SOUTH DAKOTA * Pierre, Jan 13 14 Dir, Medical Licensure Dr J F D Cook, State Board of Health, Pierre

TEXAS Galveston, March 23 25 Sec Dr T J Crowe 918 20 Texas Bank Bldg, Dallas

VERMONT Burlington, Feb 10 12 Sec, Board of Medical Registration, Dr F J Lawless, Richford

WISCONSIN * Madison, Jan 13 15 Sec, Dr H W Shutter, 425 E Wisconsin Ave, Milwaukee

WYOMING Cheyenne, Feb 2 3 Sec, Dr M C Keith, Capitol Bldg, Cheyenne

* Basic Science Certificate required

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

CONNECTICUT Feb 14 Address State Board of Healing Arts, 1945 Yale Station, New Haven

DISTRICT OF COLUMBIA Washington, April 20 21 Sec, Commission on Licensure, Dr George C Ruhlman 6150 E Municipal Bldg Washington

IOWA Des Moines, Jan 13 Dir, Division of Licensure and Registration, State Department of Health, Mr H W Greffe, Capitol Bldg, Des Moines

MICHIGAN February 13 14 Sec, Miss Flora E Dube, East Lansing MINNESOTA Minneapolis, Jan 6 7 Sec, Dr J Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis

NEBRASKA Omaha, Jan 13 14 Dir, Bureau of Examining Boards, Mrs Jeannette Crawford, 1009 State Capitol Bldg, Lincoln

NEW MEXICO Albuquerque, Feb 2 Sec, Miss Pia Joerger, State Capitol, Santa Fe

OREGON Portland, Feb 14 Applications must be on file not later than Jan 28 Sec, State Board of Higher Education, Mr Charles D Byrne University of Oregon, Eugene

RHODE ISLAND Providence, Feb 18 Chief, Division of Examiners, Mr Thomas B Casey, 366 State Office Bldg, Providence

Michigan June Report

The Michigan State Board of Registration in Medicine reports the written examination for medical licensure held at Ann Arbor and Detroit, June 11-13, 1941 Two hundred and nineteen physicians were examined, all of whom passed The following schools were represented

School	PASSED	Year Grad	Number Passed
College of Medical Evangelists	(1941, 4)*		4
University of Colorado School of Medicine	(1940)*		1
Yale University School of Medicine	(1940)*		1
Loyola University School of Medicine	(1941, 2)*		2
Northwestern University Medical School	(1941, 5)*		5
Rush Medical College	(1940, 3)* (1941)*		4
University of Chicago The School of Medicine	(1939)* (1940)*		2
University of Illinois College of Medicine	(1935)* (1941)*		2
Indiana University School of Medicine	(1940)*		1
State University of Iowa College of Medicine	(1940)*		1
Tulane University of Louisiana School of Medicine	(1940)*		1
Harvard Medical School	(1940)* (1941)*		2
University of Michigan Medical School	(1940, 2)* (1941, 113)*		115
Wayne University College of Medicine	(1941, 52)† (1941, 2)*		54
University of Minnesota Medical School	(1941, 4)*		4
St Louis University School of Medicine	(1941, 2)*		2
Creighton University School of Medicine	(1940), (1940)*		2
Cornell University Medical College	(1940)*		1
Syracuse University College of Medicine	(1940)*		1
University of Buffalo School of Medicine	(1940)*		1
Univ of Rochester School of Medicine and Dentistry	(1940, 2)*		2
Jefferson Medical College of Philadelphia	(1939)*		1
Univ of Pennsylvania School of Medicine	(1939, 2)* (1940, 3)*		5
Marquette University School of Medicine	(1941)*		1
University of Wisconsin Medical School	(1940)*		1
McGill University Faculty of Medicine	(1939)* (1940, 2)*		3

* Licenses have not been issued

† These applicants received the M B degree and will receive the M D degree on completion of internship Licenses have not been issued

Wisconsin September Report

The Wisconsin State Board of Medical Examiners reports the oral and practical examination for medical licensure held at Madison, Sept 11, 1941 The examination included 10 questions An average of 75 per cent was required to pass One candidate was examined and passed Five physicians were licensed to practice medicine by reciprocity The following schools were represented

School	PASSED	Year Grad	Number Passed
Marquette University School of Medicine	(1941)		1
School	LICENSED BY RECIPROCITY	Year Grad	Reciprocity with
University of Arkansas School of Medicine	(1937)		Arkansas
University of Illinois College of Medicine	(1934), (1937)		Illinois
Boston University School of Medicine	(1933)		Maine
University of Wisconsin Medical School	(1938)		Wyoming

Tennessee October Report

The Tennessee State Board of Medical Examiners reports the written examination for medical licensure held at Memphis, Oct 1-4, 1941 The examination covered 10 subjects and included 100 questions An average of 75 per cent was required to pass Nineteen candidates were examined, 16 of whom passed and 3 failed The following schools were represented

School	PASSED	Year Grad	Number Passed
Temple University School of Medicine	(1939)		1
University of Tennessee College of Medicine	(1941, 15)		15
School	FAILED	Year Grad	
Long Island College of Medicine	(1940)		
University of Tennessee College of Medicine	(1941, 2)		

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Malpractice: Syphilis Transmitted by Blood Transfusion; Statute of Limitations.—The patient gave birth to a child June 26, 1930. The attending physician became alarmed at her loss of blood and summoned the defendant physician to give a transfusion. The patient's brother volunteered to supply the necessary blood and the defendant used it without testing for syphilis. The defendant did not see the patient again until March 1931, prior to which time it had been discovered that she was infected with syphilis, allegedly the result of the blood transfusion. There was evidence that the defendant, on March 26, agreed to cure the patient of her syphilitic condition and treatment was instituted. The patient died, however, April 2, following an injection of nearsphenamine. Thereafter, on Feb. 14, 1933, the administrator of the patient's estate brought suit against the defendant. Pending the action, the defendant died and his executor was substituted as a party defendant. The trial court directed a verdict for the defendant and the plaintiff appealed to the Supreme Court of Errors of Connecticut.

The complaint in this case asserted three distinct bases of recovery: first, damages for the death of the patient caused by the defendant's negligence; second, damages "for the disease," for the mental and physical suffering of the patient and for the expenses incurred by reason of the defendant's negligence in the transfusion of blood, and, third, damages for the breach of an agreement to cure the patient. The defendant's answer was in effect a general denial, and by way of special defense it was contended that the applicable statute of limitations had barred each count of the complaint. Section 5987, of the General Statutes of Connecticut provides that an action surviving to or brought by an executor or administrator for injuries resulting in death, whether instantaneous or otherwise, or whether caused by the negligence of the defendant or by his wilful, malicious or felonious act, must be brought within one year from the neglect complained of or from the commission of the wilful, malicious or felonious act. Section 6016 provides that an action to recover damages from any physician, surgeon, dentist, hospital or sanatorium for malpractice, error, mistake or failure to effect a cure must be brought within two years from the date of the accrual of the right of action. There is apparent confusion among the authorities, the Court said, as to when the statute of limitations begins to run in actions for malpractice. The general rule, however, is that in a case in which the injury was inflicted at the time of the operation and not occasioned by subsequent treatment or neglect, and there has been no fraudulent concealment by the physician, the period of limitation for actions commences from the date of the wrongful act or omission, although its results may not then have developed. An action for malpractice presents a claim of a hybrid nature, the Court pointed out. In one aspect it may be viewed as based on negligence; in another aspect as based on breach of contract. The term malpractice itself, continued the Court, may be applied to a single act of a physician or to a course of treatment. The statute of limitations begins to run when the breach of duty occurs. When the injury is complete at the time of the act, the statutory period commences to run at that time. When, however, the injurious consequences arise from a course of treatment, the statute does not begin to run until the treatment is terminated.

In the present case, the evidence was undisputed that the defendant physician was not the regular attending physician of the deceased at the time that her child was born. He was called in to perform the blood transfusion and after he performed the transfusion his services to the patient ceased and he did not see her again until March 1931. It follows, the Court said, that so far as the complaint sought to recover damages for the death of

the patient, caused by the defendant's negligence, the applicable statute of limitation under the laws of Connecticut was one year; the death having occurred in April 1931 and the action having been commenced in February 1933, this cause of action was barred. So far as the complaint sought to recover damages for the "disease," the mental and physical suffering of the patient and the expenses incurred by reason of the defendant's negligence in transfusion of blood, this cause of action was barred by the two year limitation contained in section 6016 of the General Statutes, the transfusion having occurred on June 26, 1930 and the action having been commenced on Feb. 14, 1933.

The right of action for death, if it was the result of a breach of contract to cure, would run from the day the death occurred, for that was the final termination of the defendant's contract, the final and complete breach. An action for death due to a breach of contract survives, the Court said, and since the death occurred on April 2, 1931, and the action was commenced on Feb. 14, 1933, the two year period prescribed by section 6016 of the General Statutes had not elapsed. There was evidence, the Court pointed out, that the death followed immediately after the injection of nearsphenamine in the course of the treatment administered to the patient by the defendant, and if the jury believed that the defendant agreed to cure the patient it might have found the defendant liable for that death. In the opinion of the Supreme Court of Errors, therefore, the trial court erred in directing a verdict for the defendant and a new trial was ordered.—*Giambozi v. Peters*, 16 A. (2d) 833 (Conn., 1940).

Malpractice Insurance: Breach of Express Contract to Cure Not Covered by Policy.—The physician plaintiff was insured by the defendant insurance company against loss from claims for damages "on account of any malpractice, error or mistake" by the plaintiff. During the life of the policy the plaintiff expressly agreed to remove certain blemishes from a patient's face. The plaintiff's treatment having failed to remove the disfigurements, the patient sued the plaintiff for breach of express contract and the physician effected a settlement with the patient. Subsequently the plaintiff sued the defendant insurance company to recover the amount of the settlement and the counsel fees he had incurred in defending the patient's action. From a judgment for the insurance company, the physician appealed to the supreme court, appellate division, first department, New York.

The plaintiff contended that the policy written by the defendant was broad enough to cover liability for damages arising from the breach of an express contract to cure. Medicine, said the appellate court, is not an exact science and physicians know they cannot warrant a cure. If a physician does so warrant, as the plaintiff did here, and fails, he is liable for breach of contract even though he used the highest possible degree of professional skill. The legal liability in such a case is entirely different from that arising through "malpractice, error or mistake," which was the contingency provided for in the policy issued by the defendant, and it was with respect to that contingency and that contingency alone that the defendant agreed to save harmless the physician from claims for damages. Judgment for the defendant was accordingly affirmed.—*Safian v. Aetna Life Ins. Co.*, 24 N.Y.S. (2d) 92 (New York, 1940).

Society Proceedings

COMING MEETINGS

- Annual Congress on Industrial Health, Chicago, Jan. 12-13. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
- American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Diveley, 1103 Grand Ave., Kansas City, Mo., Secretary.
- Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. J. L. Budd, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.
- Society of Surgeons of New Jersey, Trenton, Jan. 28. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Physiology, Baltimore

134:165-440 (Sept.) 1941. Partial Index

- Blood Volume Changes in Men Exposed to Hot Environmental Conditions for Few Hours. N. Glickman, F. K. Hick, R. W. Keeton and M. M. Montgomery, Chicago.—p. 165.
- Differentiation of Respiratory Centers. R. F. Pitts, New York.—p. 192.
- Relation of External Pancreatic Secretion to Variations in Blood Sugar. V. B. Scott, U. J. Collignon, H. J. Bugel and G. C. Johnson, Bloomington, Ind.—p. 208.
- Production of Experimental Polycythemia in Dogs, Rabbits and Man by Daily Administration of Ephedrine; and by Amphetamine in Dogs. J. E. Davis, Burlington, Vt.—p. 219.
- Modification of Pancreatic Response to Secretin by Urine and Urine Concentrates. H. Greengard, I. F. Stein Jr. and A. C. Ivy, Chicago.—p. 245.
- Activity in Isolated Sympathetic Ganglions. K. Hare, New York.—p. 251.
- Effect of Steroids of Adrenal Cortex and Ovary on Capillary Permeability. S. C. Freed and E. Lindner, Chicago.—p. 258.
- Hemoglobin Production Increases with Severity of Anemia. Frieda S. Robscheit-Robbins and G. H. Whipple, New York.—p. 263.
- Estimation by Foreign Gas Method of Net (Systemic) Cardiac Output in Conditions Where There Is Recirculation Through Lungs. A. Keys, Minneapolis.—p. 268.
- Tolerance of Newborn to Anoxia. J. F. Fazekas, F. A. D. Alexander and H. E. Himwich, Albany, N. Y.—p. 281.
- Effect of Anoxia on Absorption of Glucose and of Glycine from Small Intestine. D. W. Northup and E. J. Van Liere, Morgantown, W. Va.—p. 288.
- Effect of Gelatin on Muscular Work in Man. P. V. Karpovich and K. Pestrecov, Rochester, N. Y.—p. 300.
- Effect of Barbitol Anesthesia on Temperature Regulation. A. Hemingway, Minneapolis.—p. 350.
- Analysis of Hypothalamic Cardiovascular Control. R. F. Pitts, Philadelphia, M. G. Larrabee and D. W. Bronk.—p. 359.
- Vertical Ballistocardiograph: Experiments on Changes in Circulation on Arising, with Further Study of Ballistic Theory. I. Starr and A. J. Rawson, Philadelphia.—p. 403.

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- Kinetics of Lung Ventilation: Evaluation of Viscous and Elastic Resistance to Lung Ventilation, with Particular Reference to Effects of Turbulence and Therapeutic Use of Helium. R. B. Dean and M. B. Visscher, Minneapolis.—p. 450.
- *Influence of Glycine on Muscular Strength. S. M. Horvath, C. A. Knehr and D. B. Dill, Boston.—p. 469.
- Analysis of Initiation of Fibrillation by Electrographic Studies. G. K. Moe, A. S. Harris and C. J. Wiggers, Cleveland.—p. 473.
- Relationship of Renal Blood Pressure and Blood Flow to Production of Experimental Hypertension. M. Friedman, H. Sugarman and A. Selzer, with the collaboration of Margaret Hooper, San Francisco.—p. 493.
- Mechanism of Enhanced Diabetes with Inflammation. V. Menkin, with the assistance of M. A. Kadish, Boston.—p. 517.
- Iodine Fixation in Thyroid as Influenced by Hypophysis and Other Factors. C. P. Leblond and P. Süe, Ivry, France.—p. 549.
- Investigation of Chemical Temperature Regulation. A. Hemingway and S. R. Hathaway, Minneapolis.—p. 596.
- Mechanism of Coagulant Action of Daboa Venom. G. Edsall, Jamaica Plain, Mass.—p. 609.
- Thyroid Activity After Iodine Ingestion. G. C. Ring, Columbus, Ohio.—p. 631.
- Effect of Varying Resistance-Load and Input-Load on Energetics of Surviving Mammalian Heart. L. N. Katz, K. Jochim, E. Lindner and M. Landowne, Chicago.—p. 636.
- Pancreatic Secretagogue Action of Products of Protein Digestion. J. E. Thomas and J. O. Crider, Philadelphia.—p. 656.
- *Influence of Physical Work on Physiologic Reactions to Thermal Environment. C. E. A. Winslow and A. P. Gagge, New Haven, Conn.—p. 664.

Influence of Aminoacetic Acid on Muscular Strength.

—Horvath and his associates determined the grip strength of 8 men twice a day for eleven weeks. Four subjects received 6 Gm. of aminoacetic acid (glycine) daily for eight weeks, 2 received it for four weeks and then placebos and 2 served as controls for nine weeks and then 1 of them was given 12 Gm. of amino-

acetic acid daily for two weeks. Improvement in the strength of the subjects receiving aminoacetic acid was no greater than that of those given placebos. Creatinine or creatine excretion showed no changes attributable to the ingestion of aminoacetic acid.

Reactions to Thermal Environment and Physical Work.

—Winslow and Gagge studied the reactions to various atmospheric conditions of 2 unclothed men performing active physical work on a bicycle ergometer at such a rate as to increase their metabolism to more than 300 Kg. calories per hour. The radiation area was the same as that for the resting subject, approximately 70 per cent of the body surface area. The convection constant of a subject pedaling at a rate of some thirty revolutions per minute was increased in cooling power to an air movement of 30 to 40 cm. per second. The increased secretion of sweat, with consequent evaporative cooling, balanced perfectly with the increased heat which must be dissipated as a result of the high metabolism. The evaporative regulation of the working subject operates so effectively that the cutaneous temperature is constant. Actually it is lower for the working than for the resting body. It seems that under these circumstances the internal temperature and not the cutaneous temperature must control the sweat-secreting mechanism. Maximal comfort is experienced by both working and resting subjects at about 2 degrees C. (3.6 degrees F.) below the point at which active secretion of sweat begins.

Anesthesiology, New York

2:489-610 (Sept.) 1941

- Summary of Studies on Optimal Composition of Local Anesthetic Solutions. M. L. Tainter, San Francisco.—p. 489.
- Protection from Cyclopropane-Epinephrine Tachycardia by Various Drugs. C. R. Allen, J. W. Stutzman, H. C. Slocum and O. S. Orth, Madison, Wis.—p. 503.
- Regional Anesthesia for Operations About Neck and Upper Extremity. R. C. Adams, Rochester, Minn.—p. 515.
- Apnea During Anesthesia: II. Influence of Morphine Alone and Combined with Atropine or Scopolamine. C. L. Burstein, New York.—p. 530.
- Anesthetic Potency and Biochemical Effects of 1 and 2 Chlor Propene-1 and 1 and 2 Brom Propene-1. B. E. Abreu, Atlanta, Ga.; S. A. Peoples, Tuscaloosa, Ala.; C. A. Handley, Vermillion, S. D., and D. F. Marsh, San Francisco.—p. 535.
- Suprascapular Nerve Block. H. M. Wertheim and E. A. Rovenstine, New York.—p. 541.
- Variation of Oil-Water Distribution Ratio of Divinyl Ether with Concentration. W. L. Ruigh, New Brunswick, N. J., and A. E. Erickson, Rahway, N. J.—p. 546.
- Development of Anesthesia. T. E. Keys, Rochester, Minn.—p. 552.

Archives of Neurology and Psychiatry, Chicago

46:569-760 (Oct.) 1941

- *The Wernicke Syndrome. N. Jolliffe, H. Wortis and H. D. Fein, New York.—p. 569.
- *Electroencephalograph as Aid in Study of Narcolepsy. J. B. Dynes and K. H. Finley, Boston.—p. 598.
- Cortical Frequency Spectrum in Epilepsy. F. A. Gibbs, W. G. Lennox and Erna L. Gibbs, Boston.—p. 613.
- Cutaneous Pressure Vibration Spots and Their Underlying Tissues. B. von H. Gilmer and S. R. Haythorn, Pittsburgh.—p. 621.
- Effect of Nicotinic Acid and Related Substances on Intracranial Blood Flow of Man. C. D. Aring, H. W. Ryder, E. Roseman, M. Rosenbaum and E. B. Ferris Jr., Cincinnati.—p. 649.
- Muscular Shortening and Dystrophy: Heredofamilial Disease. A. Hauptmann and S. J. Thannhauser, Boston.—p. 654.
- Characteristics of After Discharge Following Cortical Stimulation in Monkey. M. R. Sapirostein, New York.—p. 665.
- *Anticonvulsive Action of Azosulfamide in Patients with Epilepsy. M. E. Cohen and S. Cobb, Boston.—p. 676.
- Physiology of Spinal Cord: I. Role of Anterior Column in Hyperreflexia. O. R. Hyndman, Iowa City.—p. 695.
- Cerebral Arteriography: Its Place in Neurologic Diagnosis. S. W. Gross, New York.—p. 704.

Wernicke Syndrome.—Jolliffe and his associates review the data on the 27 patients with Wernicke's syndrome admitted to Bellevue Hospital from 1935 to 1940. In 3 the condition was of nonalcoholic origin; 2 were depressed and refused to eat, and 1 had pulmonary tuberculosis associated with vomiting. However, the fact that in all the reported cases the disease occurred in malnourished persons suggests that the syndrome is of nutritional rather than of toxic or alcoholic origin. Peripheral neuropathy was present in 25 patients, and in each it preceded or accompanied the ophthalmoplegia. The precedence or concomitance of this syndrome tends to confirm Alexander's con-

tention that less thiamine hydrochloride is required to protect against angiodegeneration than is necessary to preserve the functional integrity of the peripheral nerves. In addition to peripheral neuropathy encephalopathy due to nicotinic acid deficiency was observed in 9 patients, stomatitis due to nicotinic acid deficiency in 9, dermatitis due to nicotinic acid deficiency in 3 and riboflavin deficiency in 1. Thirteen patients recovered, and 12 of these were left with a residual Korsakoff syndrome, which does not show a consistent response to thiamine hydrochloride as has frequently been claimed.

Narcolepsy.—From a study of the electroencephalograms of 22 narcoleptic patients Dynes and Finley observe that the waking records of 17 were normal, as were those of the 16 who had attacks during the electroencephalographic recording, that is, the patterns were in all instances similar to those observed during the physiologic sleep of normal persons. The patterns of the remaining 5 patients were atypical or abnormal, suggesting that the neurophysiologic disturbance was more widespread. The fact that abnormal waking patterns differed in these 5 patients suggests that the location or the character of the lesion also differed in each case.

Azosulfamide in Epilepsy.—Cohen and Cobb describe the results that they obtained in 10 patients with severe epilepsy with the anticonvulsant dye disodium 4-sulfamidophenyl-2'-azo-7'-acetyl-amino-1'-hydroxynaphthalene-3', 6'-disulfonate (azosulfamide). The results do not establish this drug as an efficient aid in the treatment of epilepsy, but they do suggest the possibility. The sulfamidamide fraction appears to be the important one in producing the anticonvulsive effect. There is no evidence to suggest whether the effect is due to "direct" or "indirect" action on the nervous system. Either or both are possible. It is possible that the effect produced is due to the property sulfamidamide possesses of inhibiting the action of carbonic anhydrase.

Archives of Otolaryngology, Chicago

34:687-864 (Oct.) 1941

- Repair of Postoperative Mastoid Fistula: Report of Method H. I. Lillie and P. N. Pastore, Rochester, Minn.—p. 687
Fate of Autogenous Septal Cartilage After Transplantation in Human Tissues L. A. Peer, Newark, N. J.—p. 696
Electrical Phenomena of Cochlea in Man. H. B. Perlman and T. J. Case, Chicago—p. 710
Modern Treatment of Acute Tonsillitis by Injection of Bismuth Compounds A. Monteiro, Rio de Janeiro, Brazil, South America; edited by L. E. Silcox, Philadelphia.—p. 719
Recent Fracture of Nasal Base Lines of Both Outer Nasal Walls, with Divergent Displacement: Orthopedic Procedures for Obtaining Anatomic Reduction of Osseous and Cartilaginous Nasal Framework. M. F. Metzgerbaum, Cleveland.—p. 723
Vasomotor Rhinitis. Its Causation and Treatment. J. S. Stovin, New York—p. 736
Ultra High Frequency Diathermy in Otolaryngology, with Especial Reference to Dosage Measurement R. W. Teed and J. D. Kraus, Ann Arbor, Mich.—p. 743
Laboratory Analysis of Content of Tonsil Crypts as Obtained by Wet Suction Technic. G. W. McAuliffe and Marguerite Leach, New York—p. 758
Position Malignancy F. E. Motley, Charlotte, N. C.—p. 771
*Massive Doses of Vitamins A and D in Prevention of Common Cold I. G. Spiesman, Maywood, Ill.—p. 787
Management of Sinusitis in Cases of Bronchiectasis R. L. Goodale, Boston—p. 792
*Some Experiences with Sinusitis in Swimmers. J. H. Maxwell, Ann Arbor, Mich.—p. 797
Sulfamidamide and Its Derivatives D. S. Cuning and D. Guerry 3d, New York—p. 809

Vitamins to Prevent Common Cold.—Spiesman observed 54 sufferers from the chronic cold for one to three winters; 7 were given massive doses of vitamin A, 7 vitamin D and 40 both vitamins. He found that neither vitamin A nor vitamin D when given separately had any immunizing effect on the incidence or severity of the patients' colds, but that when massive doses of the two vitamins were given together the number and the severity of the colds of 80 per cent of the subjects were significantly reduced. Vitamin therapy for the common infectious cold is not offered as a panacea. Average susceptibility and the emotional state of the subject as affected by an innately unstable vasomotor mechanism must be considered.

Sinusitis in Swimmers.—During the last ten years 23 patients with acute fulminating sinusitis or its complications, according to Maxwell, have been admitted to the University Hospital; in 22 the infection extended into the calvarium or the intracranial contents, and in 13 the disease was apparently due

to swimming. Diffuse osteomyelitis occurred in 2, epidural abscess in 1, subdural abscess in 1 and abscess of the frontal lobe of the brain in 8. After surgical procedures all the patients recovered except 1, whose death on the second day after a Killian operation was attributed to massive cerebral edema associated with an unsuspected abscess of the frontal lobe. Bacteriologic studies demonstrated a growth of staphylococci in all except 2 patients; for these there was no bacteriologic report. Because of the staphylococcal origin of most of these fulminating infections, the early use of sulfathiazole is urged. It is proposed that the cause of acute fulminating sinusitis after swimming is the introduction of virulent organisms into a normal sinus which has not had the advantage of instituting local barriers to infection. The rapidly appearing signs of intracranial complications in acute fulminating sinusitis suggest that intracranial infection is established by the time frank sinus suppuration appears, and therefore the rationale of draining an acutely infected frontal sinus within the first few days to prevent intracranial complications is questioned.

Arkansas Medical Society Journal, Fort Smith

38:99-114 (Oct.) 1941

- Unilateral Renal Disease Associated with Hypertension. C. L. Wilson, Fort Smith—p. 99.
Bedside Diagnosis of Cardiac Arrhythmias D. Rowland, Hot Springs National Park—p. 102.

Bulletin New York Academy of Medicine, New York

17:735-822 (Oct.) 1941

- Newer Surgery of Heart and Large Vessels: Medical Aspects H. M. Marvin, New Haven, Conn.—p. 737.
Morphologic and Functional Alterations of Coronary Circulation J. T. Wearn, Cleveland—p. 754
Effort, Trauma, Occupation and Compensation in Heart Disease A. M. Master, New York—p. 778
Heparin and Thrombosis C. H. Best, Toronto, Canada—p. 796

Canadian Medical Association Journal, Montreal

45:201-294 (Sept.) 1941

- Progress of Medical Service Since Advent of War. R. M. Gossline, Ottawa, Ont.—p. 201.
Surgical Treatment of Goiter. H. G. Armstrong, Toronto—p. 204
Avertin-Nitrous Oxide Anesthesia in Thyroidectomy. K. M. Heard, Toronto—p. 209.
Physiologic Medicine in Modern Practice. B. T. McGhie, Toronto—p. 212
Plastic Correction of Protruding Ears in Children. H. Baxter, Montreal—p. 217.
Congenital Aplasia of Costal Cartilages Report of Case. C. S. Barker, Toronto—p. 221.
"Surgical Glove" Dermatitis J. F. Burgess, Montreal—p. 222
Cystic Fibrosis of Pancreas F. W. Jeffrey, Ottawa, Ont.—p. 224
Treatment of Osteomyelitis of Small Bones with X-Ray. R. M. Tait, Vancouver, B. C.—p. 229.
Limitations of Artificial Pneumothorax. J. L. D. Mason, Montreal—p. 231.
Further Observations on Treatment of Convulsions by Dilantin Sodium W. A. Hawke, Toronto—p. 234.
Subacute Myocardial Infarction or Necrosis. S. T. Laufer, Halifax, N. S.—p. 236
Paresis of Larynx. V. R. Lapp, Hamilton, Ont.—p. 239.
Sulfathiazole Anuria with Recovery. H. K. Detweiler, A. MacKay and A. I. Willinsky, Toronto—p. 242.
Prevention—Treatment of Choice in Pulmonary Embolism J. E. Ayre, Montreal—p. 243.
Influenza in Regina General Hospital. A. Bryant, Regina, Sask.—p. 247.
Gonorrhea in the Female. E. N. East and S. A. McTetridge, Vancouver, B. C.—p. 250
Intra Abdominal Hemorrhage G. Fleet and D. Ackman, Montreal—p. 254.
Case in Which Both Pulmonary Veins Emptied into Persistent Left Superior Vena Cava J. F. A. McManus, Kingston, Ont.—p. 261.

Canadian Public Health Journal, Toronto

32:435-490 (Sept.) 1941

- Adaptation of Venereal Disease Control Program to National Defense. R. A. Vonderlehr, Washington, D. C.—p. 454.
Improving Nutrition via the Family Budget. Marion Harlow, Montreal—p. 459
Chronic Fatigue Symptoms Among Industrial Workers R. V. Ward, Montreal—p. 464.
Papanikolaou Mediums and Standardization of Mediums in General. J. N. Aleshov, London, Ont.—p. 468.
Necessity of Provincial Plumbing Codes. A. Cousineau, Montreal—p. 472

Cancer Research, Baltimore

1:685-770 (Sept.) 1941

- Production of Cancer by Some New Chemical Compounds: Factors Affecting Latent Period of Tumor Production J. T. Bradbury, W. E. Bachmann and M. G. Lewisohn, Ann Arbor, Mich.—p. 685.
- Comparative Carcinogenicity of Some Cholanthrene Derivatives. L. W. Law and Marjorie Lewisohn, Bar Harbor, Maine—p. 695.
- Diet and Hepatic Tumor Formation J. A. Miller, D. L. Miner, H. P. Rusch and C. A. Baumann, Madison, Wis.—p. 699.
- Failure of Choleic Acids of Carcinogenic Hydrocarbons to Alter Permeability of Marine Eggs and of Mammalian Erythrocytes. B. Lucké, Philadelphia; A. K. Parpart, Princeton, N. J., and R. A. Ricca, Woods Hole, Mass.—p. 709.
- Genetic Resistance of Transmissible Sarcoma in Fowl. R. K. Cole, Ithaca, N. Y.—p. 714.
- Rapid Growth of Bronchiogenic Carcinoma. M. S. Eveleth and N. C. Wetzel, Cleveland—p. 721.
- Influence of Heptaldehyde on Pregnancy in Rats C. Caruthers and R. E. Stowell, St. Louis—p. 724.

Connecticut State Medical Journal, Hartford

5:717-796 (Oct.) 1941

- Physiologic Effects of Cold. H. G. Barbour, New Haven—p. 719.
- Low Temperature Therapy of Malignancy J. B. Herrmann, New Haven—p. 721.
- Connecticut's Part in Development of Psychiatry in America C. C. Burlingame, Hartford—p. 727.
- Scarlet Fever Immunization C. G. Thompson, Norwich—p. 736.
- Observations on Simpler Technic in Scarlet Fever Immunization. Preliminary Report C. L. Thenebe, Hartford—p. 737.
- Some Clinical Oversights of Significance M. Backer, Bridgeport—p. 741.
- Malignant Neurofibroma. F. E. Tracy, Durham—p. 753.
- Help Conserve Hearing. J. E. Davis, Hartford—p. 754.

Illinois Medical Journal, Chicago

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- Diagnosis of Carcinoma of Esophagus J. B. Costen and W. T. K. Bryan, St. Louis—p. 274.
- Treatment of Pneumonia W. L. Winters, W. W. Fox and R. Rosi, with technical assistance of Dolores Lammers, Chicago—p. 280.
- Early Diagnosis of Brain Tumors A. E. Walker, Chicago—p. 286.
- Spontaneous Hemorrhage in Sheath of Rectus Abdominis Muscle E. P. Coleman and D. A. Bennett, Canton—p. 292.
- *Bone Carcinomatosis Simulating Pernicious Anemia. Case Report B. Markowitz, Bloomington—p. 296.
- Clinical Aspects of Vitamin Deficiencies in Ophthalmology. P. C. Kronfeld, Chicago—p. 298.
- Clinical Aspects of Vitamin Deficiency in Ear, Nose and Throat L. Wallner, Chicago—p. 304.
- Management of Peripheral Vascular Disease. G. de Takats, Chicago—p. 307.
- Conservative Use of Artificial Pneumothorax G. H. Vernon, Springfield—p. 313.
- Potential Inguinal Hernia, with Especial Reference to Direct Hernia. H. L. Baker, Chicago—p. 317.
- Arteriosclerotic Heart Disease R. S. Berghoff, Chicago—p. 320.
- Immunization Against Common Communicable Diseases F. H. Maurer, Peoria—p. 323.
- Dorsolumbar Syndrome, with Special Reference to Referred Pain F. W. Slobe, Chicago—p. 332.
- *Studies of Feces and Clinical Conditions Following Ingestion of Grape Juice S. A. Portis and W. I. Fishbein, Chicago—p. 336.

Carcinomatosis of Bone Simulating Pernicious Anemia.

—Markowitz believes that the premortem diagnosis of carcinomatosis of bone simulating pernicious anemia would be made more often if the possibility was borne in mind, especially when the compensatory blood changes do not follow intensive treatment with liver extract. He cites a case in which there were the typical blood changes which simulate pernicious anemia and the other factors which should refute such a diagnosis. The patient, a white woman aged 60, complained of prolonged weakness and pains in the legs. She had been treated with liver extract. While a differential blood count was being made 16 normoblasts and 5 per cent myelocytes were encountered. There was a moderate disproportion in the erythrocytes, with increasing numbers of macrocytes and moderate poikilocytosis. The most compatible diagnosis was pernicious anemia, and blood transfusion was administered and liver extract was given subcutaneously and orally, but after two weeks of treatment there was little change in the blood picture. The diagnosis was questioned, but before much more could be done the patient died, three weeks after treatment with liver extract was begun. At necropsy essential pathologic changes were observed in the stomach and the bone marrow. The stomach was of normal size, but along the greater curvature, in about the midportion, there was an elevated rounded tumor. Microscopic examination revealed a typical adenocarcinoma. The bone marrow was

bright red and was interspersed with small purple-gray areas. On microscopic examination large groups of tumor cells were seen to have invaded the bone. The strands of marrow tissue in some areas were rich in myelocytic cells. The large number of myelocytes and normoblasts was not typical of primary anemia. This, together with the history of previous liver therapy with no apparent benefit, should suggest carcinomatosis of the bone marrow.

Effect of Grape Juice on Intestinal Flora.—Portis and Fishbein determined the effect that grape juice had on the intestinal flora of 50 institutionalized but normally active patients. The amount of gram-positive organisms was definitely increased by the daily ingestion of 24 ounces (720 cc.) of grape juice divided into three doses. The increase could be maintained by the daily ingestion of 8 ounces (240 cc.). Few if any acidophilus bacilli, as determined by stool cultures, were found in the stools of patients before grape juice was added to the diet. However, after its continued use a definite increase in the number of acidophilus bacilli was observed. The 50 subjects tended to constipation, and most of them had to resort daily to drastic laxatives, but after grape juice was added to the diet none suffered from constipation and none used laxatives during the experiment. Since gram-positive organisms are a factor in calcium metabolism it is possible that an increase in calcium absorption occurs in the intestinal tract in an aciduric medium. Furthermore, if an aciduric flora inhibits the growth of proteolytic organisms, there may be some relation between the change of flora and the absence of the so-called intestinal toxemia.

Journal of Nervous and Mental Disease, New York

94:133-264 (Aug.) 1941

- Blood Phosphorus in Mental Diseases. F. Pascual del Roncal, Madrid, Spain—p. 133.
- Etiology of Psychosis of Dementia Paralytica with Preliminary Report of Treatment of Case of This Psychosis with Metrazol. Vivian Bishop Kenyon, Osawatomie, Kan., and D. Rapaport, Topeka, Kan.—p. 147.
- Effect of Menstruation on Seizure Incidence. W. W. Dickerson, Caro, Mich.—p. 160.
- Postconcussion Syndrome: Clinical Entity. J. M. Wittenbrook, Columbus, Ohio—p. 170.
- Compact Container for Olfactory Tests. M. T. Moore, Philadelphia—p. 177.
- Music—Aid in Management of Psychotic Patient. Preliminary Report. I. M. Altschuler and Bessey H. Shebesta, Eloise, Mich.—p. 179.
- Infantilism in Male, Cured with Hormones. Case. S. Koster, Amsterdam, The Netherlands—p. 184.

94:265-404 (Sept.) 1941

- Estrogen Therapy in Psychoses. C. C. Burlingame and Marjorie B. Patterson, Hartford, Conn.—p. 265.
- Preliminary Survey of Motility in Children. J. D. Teicher, New York—p. 277.
- Experimental Insulin Shock, Particularly in Guinea Pig T. M. Allen, New York—p. 305.
- Asymptomatic Vertebral Fractures in Epilepsy: Comparison with Vertebral Fractures Due to Metrazol Induced Convulsions. M. I. Moore, N. W. Winkelman and L. Solis Cohen, Philadelphia—p. 309.
- Deforming Dystonia: Its Kinesiological Analysis. M. S. Burman, New York—p. 324.
- Syndrome of Time Agnosia G. M. Davidson, New York—p. 336.

94:405-528 (Oct.) 1941

- Acute Demyelinating Processes in Nervous System A. J. E. Akelastis and P. H. Garvey, Rochester, N. Y.—p. 405.
- Felix Vicq d'Azyr and Benjamin Franklin R. Spillman, New York—p. 428.
- Huntington's Chorea H. G. Hadley, Washington, D. C.—p. 445.
- Toxic Psychosis Due to Thiocyanate: Case Report M. R. Plesset, Norristown, Pa.—p. 447.
- *Intracranial Lesions as Cause of Sudden Death. E. V. Swift and F. P. Moersch, Rochester, Minn.—p. 452.
- Rorschach Study of Psychotic Personality in Uniovular Twins G. W. Kisker and N. Michael, Columbus, Ohio—p. 461.

Intracranial Lesions and Sudden Death.—Among 234 cases of sudden death Swift and Moersch found that in 22 death was due to intracranial conditions: in 18 to hemorrhage, in 2 to tumor, in 1 to infarction and in 1 to epilepsy. Immediate death from intracranial causes is rare. A few patients lived from ten to thirty minutes after the fatal episode; most of them lived from one to five hours. Cardiac hypertrophy was present in 78.9 per cent of the cases of intracranial hemorrhage and infarction. The most common symptom complex consists of severe sudden headache often associated with vomiting, stiff neck and sudden coma, especially when the hemorrhage is profuse. Other diagnostic features are convulsive seizures,

either focal or general in character, dilatation of the pupil on the side of the hemorrhage and generalized spasticity. Hemiplegia may be present in cases of either intracranial hemorrhage or thrombosis. Syphilis did not seem to play any special part in sudden death caused by intracranial lesions.

Journal of Neurophysiology, Springfield, Ill.

4:427-506 (Sept.) 1941

- Effect of Chronic Painful Lesions on Dorsal Root Reflexes in Dog. R. Anderson, W. K. Livingston and R. S. Dow, Portland, Ore.—p. 427.
- Reflex Activity in Spinal Extensors. J. S. Denslow and G. H. Clough, Kirksville, Mo.—p. 430.
- Steady Potential Fields and Neuron Activity. B. Libet and R. W. Gerard, Chicago.—p. 438.
- Fatigue and Refractoriness in Nerve. E. T. von Brücke, Marie Early and A. Forbes, Boston.—p. 456.
- Acetylcholine Esterase Concentration During Development of Human Fetus. K. A. Youngstrom, Durham, N. C.—p. 473.
- Localization of Cerebral Center Activating Heat Loss Mechanisms in Monkeys. L. E. Beaton, W. A. McKinley, C. M. Berry and S. W. Ranson, Chicago.—p. 478.
- Endplate Potential During and After Muscle Spike Potential. J. C. Eccles and S. W. Kuffler, Sydney, Australia.—p. 486.

Journal of Nutrition, Philadelphia

22:1-102 (July) 1941

- Severe Calcium Deficiency in Growing Rats: III. Serum Calcium of Individual Animals During Development of Calcium Deficiency. D. M. Greenberg and W. D. Miller, Berkeley, Calif.—p. 1.
- Further Observations of Riboflavin Deficiency in Dog. H. R. Street, G. R. Cowgill and H. M. Zimmerman, New Haven, Conn.—p. 7.
- Dependence of Fetal Growth and Storage of Calcium and Phosphorus on Parathyroid Function and Diet of Pregnant Rats. M. Bodansky and Virginia B. Duff, Galveston, Texas.—p. 25.
- Goitrogenicity of Soybean. H. S. Wilgus Jr., F. X. Gassner, Fort Collins, Colo.; A. R. Patton, Bozeman, Mont., and R. G. Gustavson, Boulder, Colo.—p. 43.
- Magnesium Balance Studies with Infants. C. F. Shukers, Elizabeth M. Knott and F. W. Schultz, Chicago.—p. 53.
- Nutritive Properties of Steam-Rendered Lard and Hydrogenated Cottonseed Oil. R. Hoagland and G. G. Snider, Beltsville, Md.—p. 65.
- III. Avian Thiamine Deficiency: Characteristic Symptoms and Their Pathogenesis. R. L. Swank and O. A. Bessey, Boston.—p. 77.
- Effect of Dietary Calcium and Phosphorus on Assimilation of Dietary Fluorine. Margaret Lawrenz and H. H. Mitchell, Urbana, Ill.—p. 91.

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- Excretion of Selenium by Rats on Seleniferous Wheat Ration. H. D. Anderson and A. L. Moxon, Brookings, S. D.—p. 103.
- Improved Diets for Nutritional and Pathologic Studies of Choline Deficiency in Young Rats. R. W. Engel and W. D. Salmon, Auburn, Ala.—p. 109.
- Growth Curve of Albino Rat in Relation to Diet. T. F. Zucker, Lilian Hall, Margaret Young and Lois Zucker, New York.—p. 123.
- Growth and Calcification on Diet Deficient in Phosphate But Otherwise Adequate. T. F. Zucker, Lilian Hall and Margaret Young, New York.—p. 139.
- Effect of Heat on Availability of Iron of Beef Muscle. Helen G. Oldham, Chicago.—p. 197.

Medicine, Baltimore

20:251-396 (Sept.) 1941

- Adult Scurvy and Metabolism of Vitamin C. Elaine P. Ralli and S. Sherry, New York.—p. 251.
- March Hemoglobinuria: Studies of Clinical Characteristics, Blood Metabolism and Mechanism, with Observations on Three New Cases and Review of Literature. D. R. Gilligan and H. L. Blumgart, Boston.—p. 341.

March Hemoglobinuria.—Recently Gilligan and Blumgart encountered 3 patients with march hemoglobinuria; in 1, an insurance broker, the hemoglobinuria developed on repeated occasions during short, brisk walks, and in the other 2 patients, college athletes, it developed during strenuous runs of one and a half and five miles. The athletes showed albuminuria at no time except after strenuous runs, and in the insurance broker it developed only at the time of hemoglobinuria or after a walk sufficient to produce hemoglobinemia. Two of the patients had slight chronic icterus, most evident in the scleras. The authors point out that their studies and those of other investigators suggest that "physiologic" hemoglobinemia and hemoglobinuria occur more commonly than their infrequent diagnosis suggests. March hemoglobinuria will now, perhaps, be observed more frequently because of the present strenuous military training. It is important to differentiate this relatively benign condition from the serious conditions that may lead to hematuria.

Michigan State Medical Society Journal, Muskegon

40:569-664 (Aug.) 1941

- Surgical Dyspepsias. A. L. Lockwood, Toronto, Canada.—p. 593.
- Xanthoma of Tongue: Case Report. F. A. Lamberson, Detroit.—p. 603.
- Cerebral Anoxia and Craniocerebral Injuries. F. Schreiber, Detroit.—p. 603.
- Pneumonia: Clinical Diagnosis. A. F. Jennings, Detroit.—p. 606.
- Eunuchism: Treatment with Testosterone Propionate: Report of a Case. H. L. Miller, Detroit.—p. 609.
- Uterine Inertia in First Stage of Labor. R. S. Siddall, Detroit.—p. 612.

40:665-760 (Sept.) 1941

- Planned Parenthood: Its Contribution to National Preparedness. R. N. Pierson, New York.—p. 691.
- Primary Carcinoma of Scrotum: Report of Case. K. Alcorn, Bay City.—p. 696.
- Highlights of Twenty-Five Years of Service. Marjorie Euler, Topeka, Kan.—p. 698.
- Gallbladder Disease: Surgical Treatment. L. J. Gariepy and J. H. Dempster, Detroit.—p. 705.
- Epilepsy as Traffic Hazard. L. E. Himler, Ann Arbor.—p. 707.
- Intravenous or Retrograde Pyelography? R. J. Hubbell and R. C. Hildreth, Kalamazoo.—p. 710.

Minnesota Medicine, St. Paul

24:805-900 (Oct.) 1941

- Röntgenologic Manifestations of Injuries to Chest. L. R. Sante, St. Louis.—p. 819.
- Postpartum Handling of Late Toxemia of Pregnancy. C. J. Ehrenberg, Minneapolis.—p. 828.
- Clinical Recognition of Coronary Disease. H. E. Richardson, St. Paul.—p. 831.
- Role of Drugs in Clinical Management of Coronary Disease. R. V. Sherman, Red Wing.—p. 834.
- Retrodisplacement of Uterus. M. O. Wallace, Duluth.—p. 836.
- Interpretation of Serologic Tests for Syphilis. F. W. Lynch, St. Paul.—p. 843.
- *Chronic Low Grade Oral Temperature of Local Origin in Children. W. R. Shannon, St. Paul.—p. 845.
- Practical Application of Protamine Zinc Insulin in Treatment of Diabetes Mellitus. W. A. Stafne, Fargo, N. D.—p. 846.
- Alcoholism as a Neurosis. G. R. Kamman, St. Paul.—p. 850.

Chronic Low Grade Fever of Local Origin.—Shannon believes that the possibility that regional warmth due to infection in the nasal sinuses may produce an elevation of oral temperature in children has not been sufficiently emphasized. As a result many such children are erroneously thought to have a generalized low grade fever and are forced to suffer the consequences. In such cases the general body temperature as recorded at the rectum is normal.

New England Journal of Medicine, Boston

225:475-518 (Sept. 25) 1941

- Fractures of Forearm and Elbow in Children: Analysis of 364 Consecutive Cases. A. Thorndike Jr. and C. L. Dimmler Jr., Boston.—p. 475.
- Measure of Physician's Greatness. C. F. Gormly, Providence, R. I.—p. 481.
- Dissecting Aneurysm of Aorta: Report of Case. C. C. Shaw, Bellows Falls, Vt., and H. T. French, Hanover, N. H.—p. 490.
- Controlling Clinical Therapeutic Experiments with Specific Serums, with Particular Reference to Antipneumococcus Serums. M. Finland, Boston.—p. 495.

Ohio State Medical Journal, Columbus

37:925-1028 (Oct.) 1941

- Diabetic Neuritis. C. D. Aring, Cincinnati.—p. 941.
- Clinical Use of Stilbestrol. E. H. Adler and Bessie G. Wiesstien, Cleveland.—p. 944.
- Dynamic Enteropathies. F. A. Riebel, Columbus.—p. 946.
- Role of Genetics in Cancer Research. F. Blank, Columbus.—p. 947.
- Trichinosis Treated with Sulfapyridine. F. M. Wiscley, Findlay, and I. E. Treece, Arlington.—p. 952.
- The Private Physician in the Campaign Against Diphtheria. A. Gelperin and C. A. Wiltbach, Cincinnati.—p. 953.
- *Topical Use of Sulfathiazole in Decubitus Ulcers: Preliminary Report. J. I. Goodman and J. F. Corsaro, Cleveland.—p. 956.
- Torsion of Omentum: Report of Case. C. R. Steinke, Akron.—p. 959.
- Transient Pulmonary Edema (Loeffler's Syndrome): Report of Case. A. Baer, Portsmouth.—p. 960.
- Staphylococcal Septicemia Treated with Sulfamethylthiazole: Case. A. Glorig Jr., Atlanta, Ga., and H. H. Englander, East Cleveland.—p. 962.
- Influenza Epidemics of 1918 and 1941. C. DeCourcy and O. Thuss, Cincinnati.—p. 964.
- Clinically Obscure Polyserositis with Sclerosis. C. Vilter and R. Ritterhoff, Cincinnati.—p. 967.

Sulfathiazole for Decubital Ulcers.—Goodman and Corsaro pulverized the commercially available sulfathiazole tablets and applied the powder daily, by means of a salt shaker, to the decubital ulcers of 5 chronically ill patients. The ulcers previously had been treated unsuccessfully by other accepted

methods, one for as long as twenty-one months. The quantity of the drug used varied with the size of the ulcer, as sufficient powder to coat the ulcer completely was utilized. The actual amount varied from 1 to 3 Gm. During treatment with sulfathiazole all other treatment, except light cradles or infra-red lamps, was withdrawn. Almost immediately after the sulfathiazole powder was applied the infection cleared up and clean, healthy granulation tissue, followed by healing of unwonted rapidity, appeared. The authors' success with these local lesions led them to use the method for 1 patient with chronic osteomyelitis, 2 with traumatic indolent ulcers of the feet, 1 with draining fistulous tracts in a recently amputated stump and 1 with a stubborn pilonidal sinus. Healing was rapid and complete in each patient.

Pennsylvania Medical Journal, Harrisburg

44:1505-1760 (Sept.) 1941

- Acute Segmental Enteritis. R. H. Meade Jr., Philadelphia.—p. 1519.
Analysis of Certain Visual Problems Among Elementary School Children. W. T. Hunt Jr., Huntingdon.—p. 1527.
Correlation of X-Ray and Autopsy Observations. S. J. Hawley, Danville.—p. 1534.
The Coroner and the Medical Examiner. R. P. Custer, Philadelphia.—p. 1539.
Leiomyoma Uteri with Associated Pelvic Inflammatory Disease. J. H. Mering and S. A. Chalfant, Pittsburgh.—p. 1543.
Lithopedion: Report of Case with Review of Literature. T. K. Reeves and G. S. Lipman, Pittsburgh.—p. 1548.
Bronchoscopy in Treatment of Postoperative Pulmonary Atelectasis. W. A. Lell, Philadelphia.—p. 1551.
Acute Appendicitis. L. H. Landon, Pittsburgh.—p. 1559.
Active Immunization Against Tetanus by Combined Subcutaneous and Intranasal Routes. H. Gold, Chester.—p. 1565.
Disruption of Abdominal Wounds. H. R. Owen and Bernardine M. Mahowald, Philadelphia.—p. 1570.
Tension Pneumothorax. J. Grossman, Philadelphia.—p. 1577.
Frontal Lobe Abscess of Otitic Origin. F. H. Krauss, Philadelphia.—p. 1581.
Observations on Eyegrounds of Newborn. M. L. Kauffman, Jenkintown.—p. 1583.
Observations of Larynx in Diseases of Upper and Lower Respiratory Tract. G. L. Whelan, Philadelphia.—p. 1588.
Role of Nephrectomy in Hypertension. B. Hughes, Philadelphia.—p. 1594.
Experience with Routine Contraceptive Advice to Ward Maternity Patients. O. J. Toland, Philadelphia.—p. 1599.
Several Interesting Pathologic Hearts. M. A. Goldsmith, Jenkintown.—p. 1603.

Philippine Medical Association Journal, Manila

21:379-422 (Aug.) 1941

- *Unusual Types of Typhoid Infections: IV. Atypical Duration of Febrile Periods. P. T. Lantin, J. Tranquilino, J. Aquino and J. Silva, Manila.—p. 379.
Treatment of Manic Condition with Tincture of Datura Alba. T. Joson, Mandaluyong, and J. M. Kosca, Pasay.—p. 387.
Dacryocystorhinostomy. C. D. Ayuyao and C. V. Yambao, Manila.—p. 391.
Influence of Temperature on Phenol Coefficient of Disinfectants. J. Ramirez and M. V. Mallari, Manila.—p. 395.
Should an Ice Bag Be Applied to the Head of the Hypertensive Patient with Cerebral Hemorrhage? R. V. Guiang and Maria A. Leones-Guiang, Bugallon, Pangasinan.—p. 397.

Atypical Typhoid Infections.—According to Lantin and his colleagues, among 6,000 patients with typhoid 23 had atypical febrile periods, 11 had a fever for not more than ten days and 12 had a febrile period of not less than sixty days. The authors believe that if the condition of such patients is not recognized early they can become dangerous sources of typhoid organisms which may lead to serious epidemics. The fever of the first 11 patients was moderately high and of a variable curve type. Anorexia, abdominal pain, vomiting, chills, tympanism, nausea and articular pains were accompanying symptoms. Slight intestinal hemorrhage, occurring in 1 patient, was the only complication observed. All the patients had a complete and uncomplicated recovery. A definite diagnosis was made on the evidence of positive hemoculture. The protracted fever of the 12 patients lasted from sixty-one to one hundred and fifty-seven days; in the 3 who recovered it averaged ninety-seven days. The fever was prolonged, high, continuous and of a variable curve type. The principal accompanying symptoms were headache, delirium, semiconsciousness and abdominal pain. Complications were many and varied: toxic myocarditis in 10, severe toxemia in 8, pulmonary complications in 7, typhoid asthenia in 4, intestinal hemorrhage in 3, acute hepatitis in 1, acute

cholecystitis in 1 and peripheral neuritis in 1. The mortality was 75 per cent. The diagnosis in 4 was based on positive hemocultures and on the necropsy observations of the other 8. Active typhoid lesions were observed at the necropsy of the 9 patients who died.

Surgery, St. Louis

10:535-698 (Oct.) 1941

- Cerebral Angiography. J. M. Sanchez-Perez, Madrid, Spain.—p. 535.
Carcinoma of Intrapaneatic Portion of Common Bile Duct. A. Brunschwig and W. E. Clark, Chicago.—p. 553.
Method for Collection of Entire Bile Output in Human Patients with Cholecholestomy Tubes. J. A. Layne and G. S. Bergh, Minneapolis.—p. 563.
Hypertrophy of Sphincter Choledochus: Cause of Internal Biliary Fistula. E. A. Boyden, Minneapolis.—p. 567.
Comparative Absorption Rate of Sulfanilamide from Pleural Cavity, Peritoneal Cavity and Gastrointestinal Tract in Dogs. H. B. Haag, C. R. Spealman and H. M. McCue, Richmond, Va.—p. 572.
Studies of Antihemolysin Level in Patients with Staphylococcal Infections Treated with Staphylococcus Toxoid. A. B. Longacre, New York.—p. 576.
*Inactivation of Group Specific Isoagglutinins in Relation to Transfusion of Incompatible Plasma, Serum and Ascitic Fluid. H. A. Davis, New Orleans.—p. 592.
Silk: Its Effect and Fate in Intestinal Anastomosis—Experimental Study. C. L. Hoag, J. B. Saunders, H. H. Lindner and J. M. Moore, San Francisco.—p. 604.
*Abdominal Pain in Cyclic Vomiting: Its Differentiation from Acute Appendicitis and Recommendation for Its Treatment. S. Karelitz and S. Blumenthal, New York.—p. 613.
Treatment of Inguinal Hernia by Injections Under Operative Visualization. E. E. Arnheim and H. Neuhoof, New York.—p. 624.
Simplified Technic for Amputations Through Thigh. D. A. Willis and S. L. Teitelman, Chicago.—p. 633.
Perforated Leiomyoma of Meckel's Diverticulum: Report of Case. J. D. Koucky and W. C. Beck, Chicago.—p. 636.
Five Tumors of Round Ligament of Uterus—One a Capillary Hemangioma. J. G. Schnedorf and T. G. Orr, Kansas City, Kan.—p. 642.
Hemangioma of Large Bowel. V. C. Hunt, Los Angeles.—p. 651.

Inactivation of Group Specific Isoagglutinins.—Davis tried to determine the fate of incompatible isoagglutinins when they are transfused into the blood of a recipient in the form of plasma, serum or ascitic fluid. In vitro studies showed that the isoagglutinins present in plasma, serum or ascitic fluid could be inactivated by appropriate mixture with a fluid containing opposing isoagglutinins. A mixture of group A and group B plasma in equal proportions inactivated the isoagglutinins in both plasmas so that neither agglutinated erythrocyte suspensions. Such inactivation is greater at a temperature of 37 C. than at lower temperatures. Since temperature plays an important part in isoagglutinin inactivation, incompatible plasma, serum or ascitic fluid should be heated to body temperature before transfusion. The transfusion of cold incompatible biologic fluids is more apt to result in incomplete isoagglutinin suppression, with a resultant agglutination in vivo. Likewise, a rise in temperature of the blood of the recipient, as in fever, might accelerate the phenomenon of inactivation and thereby prevent in vivo agglutination of transfused incompatible fluids. When the isoagglutinin titers of any two biologic fluids are unknown the greatest degree of inactivation of the isoagglutinins will occur if equal volumes of the fluids are used; thus when one is pooling fluids the volume factor should be kept in mind.

Pain in Cyclic Vomiting.—Karelitz and Blumenthal recommend antiketogenic therapy for differentiating the acute abdominal pain of cyclic vomiting from that of appendicitis with vomiting. In the first instance the abdominal discomfort and tenderness become less and the fever and the leukocytosis diminish, whereas in acute appendicitis the abdominal symptoms become more distinct, the tenderness persists and localizes and the fever, tachycardia and leukocytosis continue. In all cases in which the diagnosis is obscure treatment of the ketosis and deranged circulation by continuous intravenous administration of dextrose in saline solution should continue until the diagnosis is clear.

Tennessee State Medical Assn. Journal, Nashville

34:377-422 (Oct.) 1941

- Medical Relationships in Industry. C. M. Peterson, Chicago.—p. 377.
Management of Early Syphilis. A. H. Lancaster, Knoxville.—p. 382.
Carcinoma of Rectum. G. H. Kistler, Chattanooga.—p. 390.
Medical Treatment of Peptic Ulcer. W. C. Colbert, Memphis.—p. 396.
Preserving Physiologic Functions in Nasal Surgery. R. G. Reaves, Knoxville.—p. 403.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Edinburgh Medical Journal

48:577-648 (Sept.) 1941

- Future of Postgraduate Teaching. J. K. Slater.—p. 577.
Surgical Aspects of Diseases of Chest. B. M. Dick.—p. 581.
Significance of Systolic Murmurs. D. M. Lyon.—p. 589.
*Pulse Rate in Acute Juvenile Rheumatism. A. J. Glazebrook and S. Thomson.—p. 619.
Inductopyrexia: Its Technic and Application. G. M. Thomson.—p. 629.

Pulse Rate in Acute Juvenile Rheumatism.—Glazebrook and Thomson recorded the pulse rate of 100 boys from 15 to 20 years of age during the first four weeks of their acute rheumatism. All the patients showed tachycardia in the later stages of the disease. Among the 100 boys there were 30 who had subnormal pulse rates in the acute stages of the illness; in another 32 the increase was less than that expected from the rise of temperature. Bradycardia was more common in those suffering from their first attack. The pulse depression of 18 occurred within the first four days of the illness. The depression bore no relationship to the temperature. As the bradycardia followed most types of treatment it cannot be said that the treatment or a vitamin B or C deficiency was a contributing factor. It appears that a depressed pulse in the early stages of the illness is of grave prognostic significance. Permanent cardiac damage developed within six months in 12 of 15 boys with a depressed pulse early in the disease. The authors regard a pulse depression in some cases as an index of the severity of the toxemia and feel that it is due to the action of streptococcus endotoxins.

Indian Medical Gazette, Calcutta

76:385-448 (July) 1941. Partial Index

- *Toxic Complications of Sulfanilamide Therapy (Analysis of 6,070 Cases Treated in Venereal Department of Government General Hospital, Madras). R. V. Rajam and N. V. Rao.—p. 385.
Study of Cardiac Sounds and Murmurs in Severe Anemia. P. C. Gupta.—p. 392.
Multiple Primary Epidermoid Carcinoma. M. N. De and B. P. Tribedi.—p. 397.
The Arneth Count in the Tropics. Dharmendra.—p. 399.
The Arneth Count in Normal Indians. C. R. Das Gupta.—p. 404.
Note on Fevers of Typhus Group in Assam. L. S. F. Woodhead and U. C. Dutta.—p. 406.
Bacterium Alkalescens in Infection of Urinary Tract and Bacteriophage Therapy. C. L. Pasricha and A. J. H. deMonte.—p. 414.
Notes on Common Skin Diseases: III. Ringworm of Scalp, Favus. N. C. Dey.—p. 416.

Toxic Complications of Sulfanilamide Therapy.—Rajam and Rao discuss the complications that occurred among the 6,070 male and female patients treated with sulfanilamide at the venereal clinic of the Government General Hospital during the last three years. There were 1,765, or 29.08 per cent, reactions; some of them in order of frequency were fever, giddiness, nausea with or without vomiting, headache, muscular weakness, anorexia, numbness and tingling of fingers and toes, abdominal pain, pain in the chest, dermatitis, breathlessness with or without cyanosis and gastrointestinal upsets. Four types of fever, usually occurring between the fifth and tenth day of treatment and either alone or associated with dermatitis, leukopenia or breathlessness, were encountered: (1) a low intermittent fever, the temperature being rarely beyond 101 F., with an evening rise and a morning remission, lasting for a few days; (2) a sudden rise of temperature to 103 or 104 F., preceded by a chill and coming down by crisis in about twenty-four hours; (3) a fever similar to the second except that it continued for about three days and subsided slowly on or about the fourth day, and (4) shivering followed by a temperature of 104 or 105 F. the patient being very ill and toxic and having profound granulocytopenia. The toxic complications were almost equally distributed between the sexes with a preponderance of blood dyscrasias among women. The incidence of granulocytopenia in women was 1:500, whereas in men it was 1:5,000. With the exception of granulocytopenia the other toxic manifestations can be recognized by daily careful observation. It is the authors' opinion that sulfanilamide and its derivatives should be used with greater resolution than they have heretofore and that clinicians should not hesitate to administer the drugs in therapeutically adequate doses when the patients are under daily and careful control.

Revista Clínica Española, Madrid

3:1-88 (July 1) 1941. Partial Index

- Myasthenia and Gastric Ulcer. D. Furtado and C. George.—p. 16.
*Mester's Reaction in Diagnosis of Rheumatism. T. Cerviá and J. García López.—p. 20.
Insulinic Coma Provoked by 10 Units and Terminating in Death After Eighty Hours. A. D. Borreguero.—p. 23.
Postpoliomyelitic Paralysis of Quadriceps and Its Treatment. V. Sanchez-Olmos.—p. 27.
Presumed Epidemic of "Acute Posterior Funiculitis." J. A. Adrio Mateo.—p. 34.
Etiopathogenesis of Pregnancy Pyelitis. F. Bonilla Martí.—p. 37.

Mester's Test in Diagnosis of Rheumatism.—Cerviá and García López call attention to the immunobiologic reaction which Mester developed for the differential diagnosis of rheumatism. It is an intradermal test with a 0.1 per cent solution of salicylic acid, that is, four or five papules are produced with 1 cc. of this solution and the leukocytes are counted before and thirty and sixty minutes after the intradermal injection. The reaction is regarded as positive if the leukocyte count shows a reduction of 10 per cent or more after the injection. The mechanism of the reaction supposedly is like that of Widá's hemoclastic crisis. The authors employed this method in 32 subjects. Of 18 patients with rheumatism or with a history of this disease 88 per cent showed positive results, independent of the activity of the process or of the administration of salicylate. Of 14 control patients without signs of rheumatic disease 2 had positive reactions. Although the method is simple and of clinical value, it has the disadvantage that the intracutaneous injection of salicylic acid is extremely painful.

Revista Médica de Rosario, Rosario de Santa Fe

31:721-832 (Aug.) 1941. Partial Index

- *Quantitative Determinations of Sulfapyridine in Blood for Control of Clinical Effects. L. R. Ganem.—p. 779.

Quantitative Determinations of Sulfapyridine in Blood.—Ganem made determinations of the concentration of sulfapyridine in the blood of 35 patients who had 1 Gm. of the drug three times a day, up to a total amount of 20 Gm. in seven days. The author observed that the concentration of sulfapyridine in the blood depends on the capacity of absorption of the digestive tract and on the functions of the kidney. Lack of the drug in the blood or a low concentration indicates lack of absorption or a poor capacity of absorption. Concentrations as high as 20 mg. for each hundred cubic centimeters of blood can be observed in patients with renal diseases. Good results were obtained by the author when the concentration of the drug did not exceed 9 mg. Therefore a concentration of 10 mg. should be regarded as the greatest concentration necessary for obtaining good results from the treatment. According to the author the concentration of sulfapyridine in the blood should be determined in all cases. A concentration of more than 10 mg. per hundred cubic centimeters is an indication for diminishing the dose or stopping sulfapyridine treatment. Accidents from sulfapyridine therapy are caused by the administration of a large dose or by hypersensitivity of the patient to the drug. They can be prevented by the administration of small doses.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

81:507-648 (March 18) 1941. Partial Index

- Pathologic Anatomic Aspects of Goiter in Batavia. S. Tjokronegoro.—p. 515.
Odontomas and Related Conditions. H. Müller.—p. 545.
Grenz Rays in Treatment of Hemangiomas in Dermatologic Clinic in Leyden. R. D. G. Ph. Simons.—p. 563.
Tumors in Snakes. R. A. M. Bergman.—p. 571.
Melanomas Among Native Population of Netherland East Indies. R. M. Soetidjo Hardjosoekatmo.—p. 582.
Sex Hormones and Formation of Neoplasms. J. W. R. Everse.—p. 605.
*Cutaneous Cancer Among Native Population of Netherlands East Indies. R. E. J. Ten Seldam.—p. 618.
Carcinoma of Meibomian Glands. Sic Boen Lian.—p. 635.

Cutaneous Cancer Among Natives of East Indies.—Ten Seldam presents statistical data which show that cancer of the face is not less frequent among the natives than among the Europeans. The protection which the pigmented skin of the natives should provide against the biologic effect of the sun is lost by the great quantity of ultraviolet rays in tropical sunlight, and it is possible that other rays exert a carcinogenic action on the skin.

Book Notices

The Medical Aspect of Boxing. By Ernst Jökl, M.D., Head of Department of Physical Education, Witwatersrand Technical College, Johannesburg, South Africa. Cloth. Pp. 251, with 59 illustrations. Pretoria: J. L. Van Schaik, Limited, 1941.

The material of this volume is divided into two general parts: immediate effects of injuries in boxing, and remote effects of such injuries. The former part deals with the physiology and pathology of different injuries such as the chin knockout, the solar plexus knockout, the heart knockout and the carotid sinus knockout, all due to legal blows. The author produces some evidence to show that the chin knockout, the most common of the four, is due to injury to the medulla chiefly by contre-coup. It differs from the concussion of football and other sports unless the head of the injured boxer strikes the floor. There follows a brief discussion of such conditions as "grogginess" which fall short of the severity of a knockout. The latter part deals with the pathology of delayed effects of repeated blows on the chin, head or other parts. There are citations of numerous cases including some fatalities in the ring, due, in almost every instance, to repeated injuries in former fights.

The author's conclusion, from the medical point of view, is that the dangers inherent in boxing are sufficient to warrant its discontinuance. However, from the human point of view, he feels certain that it will not be discontinued and therefore suggests some protections and precautions.

The book concludes with a number of tables and an extended bibliography. It is well written although somewhat unusual in arrangement, but the field covered is so limited that its chief use will be as a library reference work.

Coming of Age. By Esther Lloyd-Jones, Ph.D., Professor of Education, Teachers College, Columbia University, New York, and Ruth Fedder, Ed.D., Guidance Counselor, Cheltenham Township Public Schools, Elkins Park, Pennsylvania. Cloth. Price, \$2.50. Pp. 280. New York & London: Whittlesey House, McGraw-Hill Book Company, Inc., 1941.

This book centers its primary interest in human growth as a part of the process of reaching maturity. Although it is primarily written for young people, many parents will appreciate it in their quest for a way of helping their children to find and give a rich and satisfying life. Professional persons in all varieties of work with young folk will welcome its sound insight, common sense and lack of dogmatism. Personality patterns are drawn realistically and objectively with analyses of family interrelationships and the part each member plays in the whole as well as one member on another. The sum of these observations is a clear picture of the family group as it operates in shaping the personalities of its members. The young person can use this material to help clarify his own picture of himself, both as he has been affected and as he affects others. The parent can find guidance in seeing more clearly the implications of his responsibility to his children.

The first chapters deal with the psychologic factors that go into the forming of personality. Examples are given of the different ways in which individuals meet their needs within their own particular life situations. Emphasis is given to the part played by insecurity and unsureness of self and how this expresses itself differently in different individuals. In growing up, young people must know the necessity of accepting limitations and of developing the abilities they possess.

Growing up inevitably involves adjustments which are discussed in separate chapters—the family, the love relationship, college, vocation. The family group provides the first experience with giving and sharing and as such is the foundation on which later adjustments are based. The home should have provided opportunities for freedom of choice and for carrying responsibility so that a young person will learn to meet emergencies and new situations "with security, poise and stability."

A chapter on men, women and love concerns itself primarily with the distinction between true love and sex attraction and the problems young people express in relation to this. A discussion brings out several concepts, mainly that true love develops slowly, grows as the relationship grows. True happiness can blossom from physical attraction, but the basis for it must be something much more real and lasting. Mature love

implies freedom for each individual and therefore necessitates unselfishness, a real sharing of common interests and growth in understanding one another.

Chapters on college and on vocation show the young person discovering himself further in relation to his own needs and sharing with others and lead to the final chapter, "What Can We Believe?" This chapter, which begins "The most distinctive characteristic of man is his quest for values," brings the book to a truly inspired conclusion. Man's eternal quest for goals—for purpose in life—is discussed. Perhaps the sentence that more than any other describes the spirit and purpose of this book is "A person cannot be considered mature until he has, somehow, learned to develop an internal authority that gives him a sense of personal responsibility for making choices in the light of the best he knows."

Principles of Microbiology. By Francis E. Collen, B.S., M.S., Ph.D., Associate Professor of Bacteriology and Preventive Medicine in the Creighton University School of Medicine, Omaha, and Ethel J. Odgaard, R.N., A.B., M.A., Instructor in Sciences Applied to Nursing, College of Saint Teresa, Winona, Minnesota. Cloth. Price, \$3. Pp. 444, with 153 illustrations. St. Louis: C. V. Mosby Company, 1941.

The task of teaching the student nurse the fundamentals of the preclinical sciences sufficiently well to underwrite intelligent practice is one that is beset with many difficulties. These are, of course, inherent in the writing of a textbook such as the present one, which is directed primarily toward this end, and account in large part for the superficial and fragmentary presentation this volume has in common with most other textbooks in this field.

The content is much the same as that of the usual medical textbook of bacteriology, but the material is rigorously cut and put in the simplest terms. The book is divided into seven sections. The first is an extended introduction which includes a discussion of the general biologic aspects of the bacteria and related organisms as well as a consideration of technics. The second and third sections, both short, are devoted to sterilization and disinfection and to bacterial variation and classification respectively. The fourth is a general consideration of infection, immunity and hypersensitivity. The fifth, and by far the largest, consists of chapters devoted to the pathogenic bacteria, viruses, rickettsiae and pathogenic fungi and protozoa. The sixth section is a consideration of the bacteriology of water and milk, and the seventh an appendix made up of formulas of culture mediums, suggested laboratory exercises and a glossary.

In general this material is up to date and clearly presented, though failure to include at least brief discussions of more recent work, such as that on spirochetosis of dogs in relation to Weil's disease, active immunization to tetanus, and the pneumococcus types comprising group IV, detracts somewhat from this general impression. The extreme degree to which the material has been condensed results in the creation of some false impressions. It is implied, for example, that the chlorination of sewage is equal in importance to the chlorination of water. Similarly it is stated that sugars are unstable to autoclaving and that sugar broths are always sterilized by the intermittent process, the last at variance with common practice in most laboratories in the case of the most frequently used sugars. It is stated also that the fermentations of the staphylococci are definite, whereas these bacteria include a wide variety of physiologic types.

In a number of instances statements are made which are open to some question. Few bacteriologists, and those the life cycle enthusiasts, would agree with the delineation of a "typical" life cycle illustrated on page 133 or the discussion on page 137, for the material presented as established fact is far from being generally accepted. Regarding the epidemiology of poliomyelitis, the statement that "the virus . . . is thought to enter through the respiratory tract. Epidemiological studies . . . have shown that the mosquito probably plays some part in the transmission of the disease" is hardly a fair one when it is all that is devoted to this matter. It is suggested that the proprietary organic mercury compounds are excellent disinfectants, comparing favorably with tincture of iodine, an obvious fallacy. Some may object to the use of the generic name *Torula* for the asporogenous yeasts, for *Cryptococcus* is generally used in the medical literature.

In the reviewer's opinion many of these faults could have been ironed out through a rearrangement of the subject matter, making use of space wasted in the extended treatment of water and milk in chapter 13, which is devoted to an unimportant discussion of nursing and microbiology, and elsewhere for a somewhat more rounded presentation of the essential material. In general, however, the presentation is an accurate and balanced one considering the difficulties under which the authors labored.

The book is profusely illustrated, eighteen of the plates being in color. The latter are uniformly good and some, such as those illustrating the cutaneous reactions, should be very useful. The book is somewhat underindexed, though the index is a good one; in a textbook of this sort it would be better to over-index slightly. The type is clear and well printed; there are remarkably few typographic errors for a first edition.

This book will probably prove to be a useful and welcome addition to nursing education textbooks; the physician will find it almost completely useless because of its elementary nature.

Society and Medical Progress. By Bernhard J. Stern. Cloth. Price, \$3. Pp. 264. Princeton: Princeton University Press; London: Oxford University Press, 1941.

The author's point of departure is "that medicine, both as a science and a profession, is inextricably bound up with the social process and with scientific developments in other fields." It shares in the cyclic movements of industry, government and education. "The long road to medical science" is built round or over or blasted through vested interests, superstition, bigotry, tradition, quackery, astrology and other obstacles to human progress. Medicine advances most rapidly when it is closest to the life of humanity and stagnates in scholasticism. These truths are told well and illustrated thoroughly, making a work of fundamental value to all who are interested in society and medical progress. The historical is better than the contemporary treatment, although the chapters on urbanization, the conquest of famine, and income and health build a good foundation for an understanding of many present problems. Emphasis is placed on the part played by "tools," buildings, institutions—on everything but the increased knowledge of the physician in the diagnosis and treatment of disease. There is frequent reference and condemnation of the "lag" between discovery and the application of medical advances but almost no mention of the ways by which organized medicine has shortened that lag through scientific testing, standardizing and endorsement or rejection of new developments. Universities and hospitals are given almost sole credit for fixing standards of medical education. It would seem that one significant "lag" has been overlooked—that between the author's knowledge and existing achievements of the medical profession.

Fundamentals of Comparative Embryology of the Vertebrates. By Alfred F. Huettner. Associate Professor of Biology, Queens College, Flushing, N. Y. Cloth. Price, \$4.50. Pp. 416, with 168 illustrations. New York: Macmillan Company, 1941.

This is an elementary textbook devoted primarily to the development of the frog, the chick and the fetal membranes of mammals. Only one feature justifies so feeble an addition to the field: this is a series of excellent new stereograms of the frog's egg and the chick embryo. The attempt to make a corresponding series of early stages of human development failed because of the author's lack of familiarity with normal material: his diagrams (figs. 158-163) have many and serious errors. A consideration of experimental work is excluded for lack of space, but there is no excuse for the failure to use the many significant interpretations of normal processes which experimental embryology has given us. The book begins with a detailed discussion of genes, which enjoy greater popularity among zoologists today than ids and idants enjoyed a generation ago. On page 46 one reads "that the chromosomes are the cellular differentiations which control growth and development is easily demonstrated . . ." This is surprising when one considers that most of the evidence furnished by the Morgan school deals with insignificant characters or with defects. Anatomic nomenclature is a matter of no significance in the author's estimation. He seems to think that most Greek and Latin plurals end in *i*. His use of terms such as perilymph and choroid plexus is astonishing, to say the least. The author's ignorance of the

adult structure and relation of the organs which he is following through ontogeny is reflected by various errors. Thus on page 301: "Since there is no body cavity in the neck or tail regions it is obvious why the sympathetic chains are lacking there." The ependyma is said to be differentiated as a distinct layer from neural fold stages on. The optic nerve fibers grow centrally, he says, "through the choroid fissure." On page 240 he writes as follows: "The brain progressively becomes relatively smaller in its development to the adult condition by pushing the successive divisions of the brain closer together, a process known as cephalization." The concept of differential growth never occurred to the author. He keeps harping on exceptions to the biogenetic law, failing to realize that most reminiscences of past racial history might have dropped out of vertebrate ontogeny as completely as they did from cephalopod development. The really significant thing is that there are recapitulations like the gill pouches and aortic arches in amniotes. The majority of human implantation sites selected for presentation were either abnormal or poorly preserved. The macerated Peters specimen is described as "probably the best preserved . . . of all human embryos"!

Oral Pathology: A Histological, Roentgenological, and Clinical Study of the Diseases of the Teeth, Jaws, and Mouth. By Kurt H. Thoma, D.M.D., Professor of Oral Surgery, Harvard University, Boston. Cloth. Price, \$15. Pp. 1,306, with 1,370 illustrations. St. Louis: C. V. Mosby Company, 1941.

This is a comprehensive coverage of oral pathology, easily the best in this field. It can be recommended without material reservation to both students and practitioners interested in and concerned with diseases of the mouth. The material presented by the author is inclusive without being unduly redundant. The longest chapters, about eighty pages each, deal respectively with modifications of growth and development, dental caries and tumors of the soft tissues. Each chapter is followed by a bibliography including liberal selection of pertinent articles from the literature, over two thousand in all; possibly there are too many, as there is little indication as to the relative value of the items cited. The illustrations are well selected from a wide range of material and add immeasurably to the value of the text. More than one third of these are reproduced from the work of other writers, but with their permission and due acknowledgment. The quality of these illustrations is generally high, although there is a wide margin between the best and the poorest. One objective of the author, to present adequately the evidence "that the tongue and oral mucosa constitute a barometer, a mirror which reflects the state of health of the patient," has been definitely attained. In no other place in the literature will such descriptions be found in such abundance. This includes not only disease in general but also especially blood dyscrasias, food deficiencies and diseases of the skin. Hereditary anomalies of the teeth and oral structures receive generous attention, including case histories and genealogical charts. All of this is done without any neglect of the usual subject matter of oral infections, tumors, dental caries or pyorrhea. There is an adequate index.

William Henry Welch and the Heroic Age of American Medicine. By Simon Flexner and James Thomas Flexner. Cloth, \$3.75. Pp. 339, with 26 illustrations. New York: Viking Press, 1941.

Here is a volume that has long been awaited by the medical profession, since it recapitulates the story of a great leader in the advancement of medical science and since the story is told by a distinguished pupil. Perhaps a single authorship would have made this a better book than it is, because its one failing seems to be the unevenness of the various chapters in their treatment of their subjects. Thus some of the chapters are highly scientific and profuse with technical terms; others have the same charming simplicity that characterized the book by James Flexner called "Doctors on Horseback." If there is any other fault of the volume it lies in its failure to recognize the human attributes of Dr. Welch which made it quite possible for him occasionally to fail in his objectives and which made it also possible that he might occasionally pursue an objective to a successful result without being willing to concede the dangers or the harm that might result from such a success. No doubt the passing of time will make possible a much more

scientific evaluation of Dr. Welch's work. The present volume is more than satisfactory as a record of his career and as a picture of the man.

Readers will learn with surprise that Dr. Welch really did not want to be a doctor, that his early inclinations were wholly toward education and the classics. Nevertheless he was descended from a line of physicians, and his decision to engage in medicine as a career met with the prompt approval of his family. His early education was supplemented by study abroad with men whose names are today associated with the fundamental studies that laid the ground for our modern knowledge of pathology and bacteriology. The mind of Dr. Welch was alert, full of curiosity, and was a scientific mind. Hence he sifted well from the vast diet that was laid before him. Nevertheless, just as Sir William Osler failed to recognize the great significance of the contributions of Pasteur, so also the great Welch seems to have failed to participate in the presentations of Robert Koch and spent his time in other studies which seemed to interest him more.

American leaders will want to read this book for its story of the beginning of the Johns Hopkins Hospital, for the innumerable contacts of William Welch with the great philanthropists who by their gifts probably did as much to force certain trends in American medicine as did the medical leaders who guided those trends. They will find great interest in the travels of Dr. Welch, and they will enjoy the inside story of the establishment of the Institute for the History of Medicine at Johns Hopkins University School of Medicine. The personality of Welch is revealed as that of a man whom many called "Popsy" behind his back but who knew him only as Dr. Welch in his official life. They will find that he was withal a lonesome man, whose influence and work still continue and have made a permanent record in American medical life. One finds that he was a great leader in the campaign against antivivisection. One would find the account more balanced if there were adequate mention of the part played by W. W. Keen in this work. One finds him credited for having established the first scientific medical journal in the United States; yet this seems hardly to recognize other contributions which were certainly in the field at the time when the *Journal of Experimental Medicine* was established. The preparation of this book undoubtedly included much research, and there is a long list of acknowledgments. There is also appended a record of the organizations with which Dr. Welch was associated, and the honors bestowed on him. There are many pages of notes documenting some of the statements made in the text, and there is an excellent index. The book stands in favorable comparison with the autobiographies and biographies which have during this year recorded for us the lives of the great faculty which made Johns Hopkins University School of Medicine the leading medical school for a considerable period in our country.

Modern Trends in Ophthalmology. Edited by Frederick Ridley and Arnold Sorsby. By J. Adamson et al. Cloth. Price, \$10. Pp. 699, with 271 illustrations. New York: Paul B. Hoeber, Inc., 1940.

This book is a compilation of material supplied by fifty-five different authors. Its purpose can best be described by quoting the editors' statements in the preface: "Clinical practice occupies a position in between the systematized knowledge (and some venerable fallacies) enshrined in textbooks, and the ferment found in the periodical literature. . . . Throughout the book it has been our aim to emphasize neither that which is already established, nor that which is as yet unformed, but to indicate emergent tendencies and formative influences." In accomplishing their purpose the editors have divided the material into seven sections: ophthalmology in relation to general medicine, diagnostic procedures, refraction and binocular vision, physiology of vision, some newer conceptions in pathology, treatment and social aspects. The editors have planned their book with foresight, and the contributors include many of the foremost ophthalmologists of our day writing on phases of the subject in which each is renowned. On the whole it can be said that the authors have succeeded admirably in fulfilling the aims which they have expressed. As inevitably must happen in a work of this type, certain of the chapters leave something to be desired while others are superb in their discussion of the material. Especially well handled are the chapters on allergy

and immunity in ophthalmology by Alan C. Woods, retinal and choroidal arteriosclerosis by Jonas Friedenwald, the intraocular pressure by Frederick Ridley, and hereditary and constitutional dystrophies of the cornea by Franceschetti and Streiff. This book is one which practicing ophthalmologists will find interesting but which beginners will hardly appreciate.

Psychogenic Factors in Bronchial Asthma. Part I. By Thomas M. French, M.D., and Franz Alexander, M.D. With the Collaboration of Catherine L. Bacon, M.D., et al. Psychosomatic Medicine Monograph IV. Paper. Price, \$2. Pp. 92. Washington, D. C.: National Research Council, 1941.

As quickly as the word was introduced into American medical circles, "psychosomatic" was given much lip service by many physicians and psychologists. Psychosomatic as applied to factors in a given case, as a branch of medicine or as a special type of research, is horribly misused and all too frequently misunderstood. This monograph on bronchial asthma may stand as a documentary definition of what is meant by psychosomatic, for it is a living model of investigation in that field.

The Chicago Institute for Psychoanalysis is exceptionally fortunate in its capacity for psychosomatic research. It commands a large clinical material on which the many cooperating analysts work, it enjoys adequate medical consultations and its directors have the vision with which to sift from the large quantities of superficial data presented at innumerable seminars by collaborators (twelve for this study) the specific psychologic factors in etiology. Yet organic factors are not overlooked or neglected. As French states, ". . . on the other hand there seems to be fairly general agreement among allergists that psychological and allergic factors may easily stand in a supplementary relationship to each other. In many cases at least it is not a question of either an allergic or a psychological etiology but of some sort of cooperation between them."

Concerning the psychologic component in the etiology, asthmatic attacks tend to be precipitated by situations that threaten to separate the patient from some mother figure, and in such a situation the asthma attack seems to have the significance of a suppressed cry. Such suppression is often the result of early demands for attitudes of independence and self sufficiency in childhood before the patient had developed such capacities. Many of the mothers were of the rejecting type. Situations which presented direct or indirect temptations toward independence evoked asthmatic attacks.

Although the number of adults and children studied in this research was quite large, the psychodynamic studies summarized are now open to statistical proof. Such fresh studies of large quantities of patients, of necessity studied superficially, must however be dynamically oriented and penetrate beneath the apparent realities of the actual precipitating factors. Many seemingly diverse situations may have in common temptation factors. It may be possible to institute short psychotherapy with good results based on a knowledge of these psychodynamics.

Internists and psychiatrists are strongly urged to study this monograph, for in the reviewer's opinion it represents a major contribution to psychosomatic research and therapy.

The Principal Nervous Pathways: Neurological Charts and Schemas with Explanatory Notes. By Andrew Theodore Rasmussen, Ph.D., Professor of Neurology, Department of Anatomy, University of Minnesota Medical School, Minneapolis, Minn. Second edition. Cloth. Price, \$2.50. Pp. 73, with 28 illustrations. New York: Macmillan Company, 1941.

Professor Rasmussen's splendid atlas is presented in a revised edition. Certain alterations in the localization of sensory tracts have been based on newer knowledge from surgical operations on human beings. The section on the diencephalon has also been revised. The drawings have been made with meticulous care and deserve thorough study. The book is highly recommended for students and specialists.

Psychiatry as a Career. Published by The Institute for Research, Chicago. The Institute for Research, Research No. 116. Paper. Price, \$1. No pagination, with illustrations. Chicago, 1941.

This little brochure is part of a series of articles written to answer questions of young men who are about to choose their careers. The material is written in easily understandable style, and the contents represent a fair and adequate statement of the psychiatrist's functions. It can be recommended to college students who show a beginning curiosity regarding psychiatry.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

LOSS OF HEARING FROM DYNAMITE BLAST

To the Editor:—A gold miner was working in a raise with a stoping machine when dynamite was blasted from a place about 100 feet below and 20 feet away from the place where he was. The man suddenly felt dizzy and noticed he could not hear anything. He was treated at the company hospital, and after a few days hearing returned to one ear, but the other ear remained deaf six months afterward. This is a labor compensation case. Can the deafness be attributed to the blasting at the distance mentioned? What is the prognosis with regard to the return of hearing in the deaf ear?

Jose S. Santillan, M.D., Manila, P.I.

ANSWER.—Loss of hearing from an explosion may be due to rupture of the drum membrane, in which case the loss is not complete and recovery occurs as the drum membrane heals, or it may be due to trauma to the end organ of hearing in the labyrinth as a result of the sudden loud noise, in which case the hearing may be completely lost, but more often the impairment involves only part of the tone range and in the ensuing weeks there is generally partial recovery.

Complete and persistent loss of hearing following exposure to an explosion may occur in soldiers under shell fire on a functional basis (hysterical deafness).

In the case of the gold miner a complete examination of the ear and hearing with appropriate tests (Weber, Rinne, Schwabach and audiometer tests) to demonstrate the location of the lesion and the Stenger test to detect malingering should show which type of lesion this patient has suffered. The fact that the hearing has returned in one ear but not in the other speaks for an organic rather than a functional defect. After six months further improvement in an organic defect would not ordinarily be expected to occur. Whether damage to the ears could occur at the distance mentioned depends on the intensity of the blast. If workers are usually exposed to this sort of blasting at the distance stated without damage to the ears it would seem unlikely that the blast caused the deafness. There is, however, considerable individual variation in the susceptibility of the ear to acoustic trauma.

ONYCHIA AND DERMATITIS IN WORKER WITH CLEANING FLUIDS

To the Editor:—A man aged 28 has onychia. His occupation is that of a cleaner. This condition is most severe on both thumbs, and there is a rash on the thenar eminence of the left hand. The rash resembles eczema. There is no evidence of any disorder in the nervous system or infection or presence of foreign bodies. The Wassermann reaction is negative, and the patient appears to be in sound health. I have used the ordinary treatment for eczema with no results. I was formerly of the opinion that this irritation might be due to the solvent, made by the Du Pont Company, used in the cleaning business. The patient did not permit his hands to come in contact with this solvent for some time, and decided improvement was present. However, he continued to work in his place of business, and I was in doubt as to whether the inhalation of these fumes was sufficient to keep the inflammatory process active. I would appreciate your opinion and any suggestions as to further treatment.

L. H. Dunham, M.D., Scottsbluff, Neb.

ANSWER.—Both the dermatitis and the onychia may be the result of such occupational contact with a chemical solvent. It is not believed that a condition of this type could result from inhalation of fumes. It is most likely that the solvent, following repeated contact with the skin, has produced a dermatitis. Such dermatitis usually develops as a dermatitis venenata or simple contact dermatitis and becomes eczematized through repeated recurrence or chronicity. Solvents usually act as irritants both by removing the protective coating of natural oil and superficial epidermal cells, following which the skin is more vulnerable to all types of irritation including that caused by soap and water, or the solvent acts as a direct chemical irritant as a result of penetrating the pores or the epidermis itself. In chronic dermatitis of this type, onychia or nail changes of a dystrophic type frequently develop as a result of disturbance of nutrition of the growing nail at its matrix because of the dermatitis in the region of the nail. The observation that the condition improved following avoidance of contact with the solvent supports a diagnosis of occupational dermatitis and onychia. The possibility of onychomycosis or fungous infection of the nail must also be

considered, though the latter condition is not commonly observed and is usually associated with evidences of fungous infection elsewhere, particularly on the toes and involving the toenails.

When all the nails or the majority of the nails are involved, consideration must be given to possible constitutional or nutritional disturbances; but if the involved nails are only those on the thumbs or fingers that also exhibit dermatitis, then occupational dermatitis is more likely to be the cause.

The first and most important procedure in treatment is, of course, removal from contact with the irritant by change of work. If this cannot be carried out, protective measures should be followed whenever exposure to the solvent occurs, such as the wearing of rubber gloves or finger cots or bland protective creams and bandages. In the treatment of the dermatitis itself, when the condition is the result of an occupational irritant, bland creams are best, and where the solvent may have dried the skin excessively an ointment containing hydrous wool fat is usually desirable. It is not probable that the onychia will be responsive to treatment, but once the dermatitis has been healed normal nail growth is likely to occur. In a chronic phase of dermatitis, weak tar preparations in ointment form are likely to be helpful and, in dermatologic practice, small doses of unfiltered roentgen rays are frequently helpful but must be used cautiously to avoid permanent damage to the nail matrix.

ERGONOVINE IN LABOR

To the Editor:—Will you please give me information on the use of ergonovine intravenously at the end of the second stage of labor to prevent blood loss?

J. B. Carlyle, M.D., Burlington, N. C.

ANSWER.—Ergonovine is a powerful uterine stimulant and is rapid in action. It has been administered orally, intramuscularly and intravenously. The pharmacology of this drug has been investigated and a review may be found in the medical literature. About three years ago M. E. Davis and his associates at the Chicago Lying-in Hospital instituted, as an experimental procedure, the use of ergonovine administered intravenously at the end of the second stage. Davis suggested the following technic: When the baby's head has been delivered and the anterior shoulder has been brought into view, 0.2 mg. of ergonovine is given intravenously. Twenty or thirty seconds are allowed to elapse for the drug to take effect and then the baby is delivered. With the evacuation of the uterine cavity and under the influence of this powerful oxytocic, the uterus contracts down quickly, thereby separating the placenta from its attachment. At the same time the placenta is usually pushed out of the upper segment into the distended lower segment and vagina.

According to Davis (Postpartum Hemorrhage, *Am. J. Surg.* 48:154 [April] 1940) the intravenous use of ergonovine produces complete separation in most instances because of the effectiveness of the contraction of the uterine musculature. The sudden reduction of the placental area shears the placenta from the uterine wall during the initial contraction; the blood loss is thus reduced, and the incidence of third stage complications has been said to be greatly decreased. Rarely the separated placenta will be caught in a contraction zone at the junction between the upper and lower segments, and manual removal may have to be resorted to. This drug should be administered only in a hospital, as an assistant is needed to give the drug so that the obstetrician may devote his entire attention to the uterus and extraction of the placenta.

In some experimental animals ergonovine has been shown to be approximately one-fourth as toxic as ergotoxine and ergotamine. Although gangrene can be produced experimentally, no clinical reports have appeared describing the occurrence of gangrene in human beings following the use of ergonovine. Toxic symptoms closely resemble those produced by the older alkaloids of the ergot series.

PROGNOSIS IN CARCINOMA OF RECTUM

To the Editor:—I have made a diagnosis of primary adenocarcinoma of the rectum. The mass is at the rectosigmoidal junction. The patient was roentgenographed for every available part to which carcinomatous tissue commonly infiltrates; for example, the long bones of the body, the lungs, the stomach, the liver, the urinary bladder and the kidneys. The carcinomatous mass has been removed in toto. What would be the prognosis in such a case?

John B. Bellucci, M.D., Chicago.

ANSWER.—Statements as to prognosis in a case of primary adenocarcinoma of the rectum are difficult. In general, the prognosis depends on the age of the patient, the duration of symptoms, the size of the growth itself, the histologic type and whether or not spread has occurred to the regional lymphatics.

Papillary tumors have a better prognosis than infiltrating ones. Where the neoplasm has not extended through the muscular wall of the bowel, the prognosis is much better than when invasion through the serosa has occurred. Wide resection affords a greater chance for prolonged survival than more limited excisions. Recorded experience over the past several decades indicates clearly that improved methods of excision have afforded an ever increasing incidence of prolonged survival. Statistics for prolonged survival following apparently complete excision of rectal carcinomas vary considerably, the best being anywhere from 50 to 60 per cent of those surviving the operation. In series of unselected cases the five year survival is variously stated as 25 to 30 per cent of those surviving the operation. It would seem that the latter figure is conservative and might well represent the true situation with regard to these cases in general. The failure to recognize by clinical and roentgenographic examination evidences of metastases during the period shortly following operation would be of little significance in affording a prognosis, since satisfactory recovery from these operations and a period of apparent freedom from disease are only too often followed by development of metastases. Any patient surviving five years or more from resection of a primary adenocarcinoma of the rectum would appear to have an excellent chance for permanent "cure," unlike some other types of neoplasms in which five year survival does not necessarily indicate that recurrence or latent metastases may not subsequently manifest themselves.

MOTTLED ENAMEL FROM FLUORIDES

To the Editor:—What can be done to restore fluoride mottled teeth to normal whiteness? Is it possible to grind the surfaces of such teeth and cement porcelain caps over them? If such a procedure is possible, is it injurious to the teeth? What unfavorable complications might follow a properly performed operation of this type? If this work is done, where can I obtain a list of those competent to do it?

M.D., Texas.

ANSWER:—Because mottled enamel (endemic dental fluorosis) is a developmental enamel hypoplasia and because dental enamel is incapable of self repair during its post eruptive life, one should not expect even with the best known therapy that the enamel will be restored to normal translucency. A method of removing the brown stain from mottled enamel teeth, using a hydrogen peroxide-ether solution, has been described by Ames (*J. Am. Dent. A. & Dental Cosmos* 24:1674 [Oct.] 1937), which is reported to ameliorate this distressing condition considerably.

It is, of course, possible to remove the enamel and prepare the tooth for the reception of a porcelain jacket crown. An operation of this type for a tooth affected by mottled enamel should not involve any greater liability to the occasional pulpal devitalization or the recession of the gums than might follow in the case of a tooth not affected by mottled enamel. The preparation of a tooth for and the placement thereon of a porcelain jacket crown is routine practice for any well trained dentist.

In cases of even severe brown stain it would seem advisable to try first the brown stain removal therapy before recourse is had to the more radical porcelain jacket procedure. The attempt to remove the brown stain by grinding off the outer enamel surface followed by polishing or the inexcusable use of acid preparations in an attempt to remove brown stains are to be avoided because of the frequency of postoperative sensitivity to thermal changes.

It is not possible to furnish a list of those competent to remove brown stain from mottled enamel teeth, but it is thought that an inquiry to the dental society officials at either Amarillo or Lubbock (Texas) communities severely affected by mottled enamel might disclose the names of local practitioners experienced in this particular technic.

URETHRAL CARUNCLE

To the Editor:—What is the treatment for urethral caruncle?

M.D., Wyoming.

ANSWER:—The first step in the treatment of urethral caruncle is accurate diagnosis. Prolapse of the mucosa of the external meatus of the urethra frequently is erroneously regarded as a caruncle. Excision or cauterization of the prolapsed mucosa usually is followed by an eroded area, which often causes considerable distress and irritation. A caruncle usually can be demonstrated by the presence of a pedicle.

The best method of treatment of a caruncle is to clamp its pedicle with a fine, flat clamp applied as close to the urethral mucosa as possible. The protruding portion of the caruncle is then snipped off with scissors. Cauterization can best be accomplished by applying a standard solution of acid nitrate of mer-

cury to the basal tissues in the clamp. Care should be taken that the solution does not come in contact with the surrounding mucosa.

Incidentally, it should be remembered that many caruncles do not cause any symptoms and, if small, are frequently best left alone.

MONILIASIS AND VITAMIN DEFICIENCY

To the Editor:—Can you tell me of any work that has been published on the problem of producing a relative deficiency of one group of vitamins by overdosing of another group? What is known about overdosing in relation to any of the vitamins? A patient who manifested no obvious deficiency symptoms had taken thiamine hydrochloride 3 mg. a day for a year. She then started taking B complex 6 capsules a day, each capsule containing 333 international units of B₁, 500 micrograms of riboflavin, 130 micrograms of B₆, 10 mg. of nicotinic acid and 14 Jukes-Lepkovsky units filtrate factor. After about a month of this dosage the patient contracted a moniliasis of the mouth. I have wondered whether this infection may represent a deficiency of one of the other vitamins.

M.D., New York.

ANSWER:—It is not certain that moniliasis is a true manifestation of specific deficiency disease, although it is evident that in many people with B complex deficiencies various organisms of this type grow within the alimentary canal or in the mouth. In all probability they are secondary invaders.

There is indirect evidence that imbalance in medication with various B complex factors may lead to difficulties of one kind or another. The mechanism of this is not clear and it has not been shown that overadministration of one B complex factor produces a deficiency of another. However, there are two reported cases in the literature of pellagra developing after exclusive vitamin B₁ therapy (Braendstrup, Poul: *Pellagra Developing During Exclusive B₁ Therapy*, *Ugesk. f. læger* 102:95 [Jan. 25] 1940. Salvesen, Olaf: *Nord. med.* 5:297 [Feb. 17] 1940), but it cannot be assumed that in these cases pellagra would not have developed even if no thiamine had been administered. It is well known that evidence of thiamine deficiency may develop in patients with endemic pellagra during treatment with nicotinic acid if the diet is not improved or other B complex factors are not administered (Aring, C. D.; Evans, J. P., and Spies, T. D.: *Some Clinical Neurologic Aspects of Vitamin B Deficiencies*, *THE JOURNAL*, Dec. 9, 1939, p. 2105). There is a discussion of this problem in the 1941 Annual Review of Biochemistry (Morgan, A. F.: *Annual Review of Biochemistry*, 1941).

RECURRENT MYXOSARCOMA

To the Editor:—Two years ago a retroperitoneal myxosarcoma was removed from a woman in her early thirties. Its size was approximately 3 by 4 by 6 inches. It has now recurred, and its present size is again approximately the same. Can you advise me as to the prognosis and proper treatment? Is the roentgen ray used either as a complete treatment or postoperatively?

M.D., Minnesota.

ANSWER:—The prognosis and treatment depend on clinical and microscopic information that is not available in the data submitted. Roentgen therapy is used as a postoperative measure in operable lesions and as the sole treatment when the lesion is inoperable (Ewing, James: *Neoplastic Diseases: A Treatise on Tumors*, Philadelphia and London, W. B. Saunders Company, 1940).

ALLERGY TO SPERMATOZOA NOT PROVED CAUSE OF STERILITY

To the Editor:—Could a wife be allergic to her husband's sperm and could this be a cause of sterility? If this should be true is there any method of determining it? Is there any treatment (desensitization)? The young woman in question has had all types of tests and all give normal results. The oviducts are patent, the uterus is normal in size and the menstrual history normal, twenty-eight days, three to five day type with no dysmenorrhea. The husband's spermatozoa are highly motile and abundant in number. There is no history of contraceptives or acid douches being used. Could my opening question be a factor in the cause of sterility in such a case? If so, what can be done? Any suggestion would be appreciated.

M.D., Michigan.

ANSWER:—There is no sound evidence that a woman can become allergic to the spermatozoa of her husband. For many years animal experiments have been carried out in which the fertility was reduced or complete infertility established by the long continued parenteral injection of homologous semen. More recently, however, Eastman, Gutmacher and Stewart concluded, after a series of animal studies, that the injection of semen slightly reduced the fertility of the recipients but that the reduction was without practical importance.

Possibly some unknown factor is responsible for the infertility of this couple. Basal metabolic determinations on the husband and wife may warrant the use of thyroid. If air or gas was

used in establishing the patency of the oviducts, this procedure can be repeated after an interval of at least a year, using iodized oil. This will afford the opportunity to visualize the reproductive tract and furthermore it may enhance the possibility of gestation. When all the factors which tend to decrease fertility have been removed, gestation will probably result.

PURPURA

To the Editor:—A woman aged 38 in good health, with no evidence of the menopause as yet, has ecchymotic spots on various parts of her body at intervals of a few days. The first thing she notices is the onset of a sudden sharp, stinging pain, and in a few minutes a small swelling appears in this site, usually about $\frac{1}{8}$ to $\frac{1}{4}$ inch in diameter and slightly raised. A few minutes or hours later she notices a small black-blue area in the location where the swelling took place. These spots look like a small bruised area without tenderness. The lesions have appeared in various parts, but mostly on the arms or legs. In three or four days the discoloration disappears completely. I am at a loss to explain these lesions unless they are due to a sudden rupture of a small capillary, and if this is the case what would provoke such a condition? What can be done to prevent them? Is the condition serious and might such a condition occur in the brain? These spots occur one at a time, and never are there more than two in a period of a week or more.

M.D., Kansas.

ANSWER.—The lesions described are those of purpura. Since purpura is only a syndrome, it is necessary to obtain further data before the etiology can be established. A complete blood examination, including a platelet count, is essential. The prognosis and treatment depend on the cause.

If thrombocytopenia is present, it is important to determine whether it is primary or secondary in type. Among the more common causes of secondary thrombocytopenic purpura are leukemia, metastatic disease of the bone marrow and toxic depression of the marrow, as in aplastic anemias.

If the platelets are normal, the purpura may be idiopathic or secondary to various toxic conditions. Bleeding in the urine and stool may presage hemorrhages into the brain. Frequently, however, this condition is not progressive. Treatment is not highly satisfactory. Occasionally an allergic basis is present, foci of infection should be looked for, and finally some cases respond to endocrine therapy. In some cases, especially in women, the superficial veins appear to be unusually fragile, causing a harmless variety of purpura.

HALITOSIS FROM MAXILLARY SINUSITIS

HALTUSIS FROM MAXILLARY SINUS.
To the Editor:—I have had repeated attacks of bad breath for many years. I had my tonsils removed some years ago, with some improvement. Later, however, these attacks have seemed more frequent than usual. I have had constant sinus drainage that I know about since 1928. It is purulent in type, and to judge from roentgenograms and observable drainage it is confined largely to the left maxillary sinus. I have no symptoms other than drainage; there are no headaches and no pressure pain over the sinus area. Is such drainage sufficient to cause bad breath? Can you recommend measures to cure such a condition that offer more assurance of cure than just repeated operation for adequate drainage? Drainage seems profuse through the nose all the time, although I am aware that that does not drain the bottom of the sinus area.
 M.D., Texas.

M.D., Texas.

ANSWER.—It must be assumed that the diagnosis of chronic maxillary sinusitis on the left side is established. The purulent secretion present at all times can be responsible for repeated attacks of bad breath. This does not mean that a search should not be made for other causes.

Operative intervention properly carried out will give a satisfactory result in a large number of cases. Such intervention in the nature of a Caldwell-Luc operation is, as a rule, successful in the first instance. The object of the operation is not only to supply adequate drainage but to remove as far as possible all diseased mucous membrane. In only a small percentage of cases is it necessary to reoperate.

CHOCOLATE AND LEAD

CHOCOLATE AND LEAD

To the Editor:—Several times I have heard patients comment on the fact that there is lead in commercial chocolate, and they have asked me whether or not it is true and whether or not there is sufficient lead to be harmful. Apparently this has come from Consumers Research or some such organization. H. L. Mawdsley, M.D., San Mateo, Calif.

ANSWER.—Some years ago there was considerable discussion as to the amount of lead which can be obtained from eating chocolate. Small quantities can be found just as can be found in other foodstuffs, but as a result of this agitation chocolate manufacturers took great pains to eliminate any lead from their product as well as from the wrappers on the chocolate. It would appear safe to say that chocolate is as free as other foods from lead. Any processed food may have small quantities

of lead, either from the natural content of lead in the food or from small contaminations in the process of manufacturing, but these extremely minute quantities have never been shown to produce any deleterious effects in animals or in man.

PROGNOSIS AFTER CHOLECYSTOGASTROSTOMY IN INFANT

To the Editor:—An infant of 2½ months was operated on for obstructive jaundice at 3 weeks of age. An atresia of the bile ducts was present. A small gallbladder with clear bile was found, and a cholecystogastrostomy was done. A small amount of bile has been coming through the stool since. The icteric index has come down from 320 to 115. What is the usual course and prognosis in such a case? Should bile salts be given, and if so how much and what kind? Is any other medication or diet indicated?

M.D., New York.

ANSWER.—The presence of bile in the stools and decrease in the icteric index is definite evidence that the obstructive jaundice has been relieved. In all probability the condition will continue to improve with the growth of the child and in a few months should be entirely cleared up. There is, of course, the possibility that narrowing of the fistulous tract may come on, but this is not the usual course in these cases. If it does occur it can probably be relieved by secondary operation.

In the meantime it may be advisable to administer bile salts and an acceptable vitamin K preparation once a day until the jaundice has disappeared.

DENTAL EXTRACTIONS AFTER CORONARY OCCLUSION

To the Editor:—A man aged 57 was operated on two years ago for suppurative mastoiditis. At that time it was found that he had many chronically abscessed teeth and myocardial damage. On complete recovery from the mastoid involvement it was urged that he have proper dental care, which was done in a rather indifferent manner on his part. Two weeks after the extraction of a tooth a coronary occlusion followed. Please advise me as to how soon it could be considered safe to entertain the idea of removing the remainder of the abscessed teeth? The occlusion took place three weeks ago, apparently the posterior group. Progress toward recovery has to date been satisfactory. M.D., Virginia.

M.D., Virginia.

ANSWER.—It seems probable that the coronary occlusion was not associated with extraction of the teeth. The problem at the present time is to permit the complete recovery of the patient from coronary occlusion, and further extraction of the teeth should not be planned until there is no longer evidence of coronary change. Usually recovery sufficient for necessary extractions would occur in three to six months. In future extractions epinephrine in local anesthesia is to be avoided.

HAZARD OF TUBERCULOSIS IN SOUTHWEST

HAZARD OF TUBERCULOSIS IN SOUTHWEST
To the Editor:—A boy aged 11½ years during damp, cold weather, suffers from fleeting migratory neuralgic pains. This began two and one-half years ago. There is no evidence of rheumatic fever. His general condition is good. An ethmoiditis is present. He has been in Florida for the winter. I should like to take him to an area of low humidity, such as Tucson or Phoenix, Ariz., or Palm Springs, Calif. As there are supposed to be many cases of tuberculosis in these Arizona cities, would there be any danger in living there? Are latent or healed cases allowed in the public schools and, if so, would contact be dangerous? Or would you advise Palm Springs, Calif., which is also located in an arid area?

Irryng Friedman, M.D., Peekskill, N. Y.

ANSWER.—There would be no danger in having an 11½ year old boy live in Tucson, Ariz. His exposure to tuberculosis contact in the public school systems of Arizona would be no higher than it is in Peekskill, N. Y.

PILONIDAL CYST

PILONIDAL CYST

To the Editor:—In the October 18 issue of *The Journal*, p. 1404, there appeared a question entitled Pilonidal Cyst. The case cited concerns a recurrence of this lesion. Please permit me to call your attention to radiation therapy as an effective form of treatment for recurrent pilonidal cysts and sinuses (Turell, Robert: Radiation Therapy for Recurrent Sacrococcygeal Cysts and Sinuses, *Surgery* 8: 469 [Sept.] 1940). I have reported 4 cases of recurrent pilonidal sinuses that responded to therapy in doses of 600 to 900 roentgens. More recently, however, a larger dose of 1,200 to 2,100 roentgens has occasionally been employed. In the original paper I said "It is conceivable that, when all branches of the sinus or ectopic epithelium are incompletely removed during the original operation, radiation therapy may fail, and reoperation may become necessary." Radiation therapy was suggested mainly on the proposition that recurrence after operation is due primarily to incomplete extirpation of infected tissues. I feel that this form of therapy, based on subsequent personal experience and on that of several colleagues specializing in radiation therapy, is an effective substitute for operation for recurrence of infected pilonidal (sacrococcygeal) sinus. Reoperation, however, is indicated in cases in which branches of the cyst or sinus or ectopic epithelium were incompletely removed at the original operation.

Robert Turell, M.D., New York.

Robert Turell, M.D., New York.

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USES AND LIMITATIONS OF ESTROGENS IN GYNECIC PRACTICE

E. C. HAMBLÉN, M.D.

DURHAM, N. C.

Estrogens constitute a diverse group of chemical compounds capable of producing estrous phenomena in experimental animals and reproduction in woman, to a great degree the physiologic functions which are attributed to the follicular hormone of her ovaries.

There are two general classes of estrogens: (1) those which are identical chemically with the steroids extracted from the ovaries, placentas or body fluids, i. e., hormones, and (2) those synthetic pharmacologically active agents which bear no structural chemical likeness to natural hormones.

All three of the estrogenic hormones—estrone, estriol and estradiol—have been extracted from woman's urine and are available commercially as free steroids or as esters. During the past three years estrogenic compounds derived from stilbene, particularly diethylstilbestrol and its esters, have been subjected to broad clinical investigations looking toward their release into commerce by the Food and Drug Administration.

The primary pharmacologic action of estrogens is on the genital system: endometrial, cervical and vaginal epithelium; myometrium; endometrial and myometrial vascular systems, and the parenchyma of the breasts. Secondary effects are produced in the skin and its appendages, the peripheral vascular bed and, perhaps, the osseous system. Reciprocities in function exist between estrogens, the anterior lobe of the pituitary gland, the adrenals and thyroid. No evidence has been submitted that estrogens stimulate ovarian function. There is good reason to believe, however, that they may depress this function by means of effects on the pituitary. These last two considerations qualify their therapeutic role as being a substitutional or complementary one rather than one which permits stimulation of hypofunctioning ovaries.

In general, the gynecic conditions in which estrogens have been employed on presumed rational indications are (1) substitutional or complementary therapy in those instances of adolescent or adult ovarian failure wherein the functional pathologic condition is intrinsic to the ovaries themselves; (2) in the treatment of local hypoplasias of the accessory sexual system; (3) as antagonistic therapy in hyperfunctional states of other glands, such as the pituitary or adrenals, and (4) for specific local effects on certain tissues, i. e., the vaginal epithelium, the estrogens being employed as pharmaco-

logic agents rather than as means of treating endocrine disease.

In these various therapeutic applications estrogens have been administered effectively by various routes: by mouth, intramuscularly, topically applied to the vaginal and the nasal mucosa, by dermal inunction and by the subfascial implantation of sterile pellets of compressed crystals of hormone. None of these methods permit, doubtlessly, an entirely efficient or economical duplication of normal physiologic levels of estrogenic function.

My purpose in this communication is a consideration of uses and limitations of estrogenic therapy in gynecology when based on the aforementioned and apparently rational indications.

ESTROGENIC THERAPY IN OVARIAN FAILURE

Diverse grades of ovarian failure result from numerous causes, some of which are intrinsic to the ovaries while others are related to primary aberrations in other glands or are due to strictly extra-endocrine causes. An ideal therapy would permit the salvage of both the germinal and the endocrine functions of ovaries, i. e. would induce or reinstitute normal fertile ovarian cycles. When there is resort to substitutional or complementary therapy with estrogens, the immediate result may be quite satisfactory from an endocrine point of view, but this therapy cannot substitute for the germinal failure of ovaries. Estrogenic therapy is rational only in hypovarianism due to intrinsic ovarian failure, such as that which results from surgical or roentgenologic damage, pelvic disease or tumors or sexual aging. Hypovarianism due to thyroid, adrenal or pituitary disease or resulting from constitutional impairment should be handled, if possible, by therapeutic attention to the primary cause rather than by substitutional therapy at the ovarian level. If apparent or real ovarian failure is related to inadequate endometrial function, complementary therapy with ovarian steroids may constitute a rational therapeutic approach.

When there exist severe grades of intrinsic ovarian failure, of either estrogenic or corpus luteum type, substitutional therapy with estrogens or with estrogens and progesterone, regardless of how dramatic the immediate endocrine responses are, has obvious limitations: 1. Complete substitution year after year for the endocrine functions of the ovaries, similar in kind to that necessary with thyroid substance for hypothyroidism or with insulin for diabetes mellitus, imposes a financial burden which few patients can assume. 2. If and when treatment is stopped, regressional alterations promptly follow which destroy for the most part the accomplishments of therapy; the combined use of estrogens and progesterone under these circumstances is said to lessen the regressions which follow withdrawal of therapy. 3. Despite most intensive therapy of this sort, patients remain sterile.

From the Endocrine Division of the Department of Obstetrics and Gynecology, Duke University School of Medicine and Duke Hospital.
Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

These aforementioned limitations delineate no clear-cut gynecic applications of prolonged substitutional therapy. Fortunately, ovarian deficiency rarely impairs health or somatic efficiency. The cosmetic inelegance of the young woman with well defined adolescent hypovarianism constitutes one of the few conditions, if not the only one, in which some attempt at limited employment of complete substitutional therapy seems indicated at present. The rationale of therapy in this condition is (1) to curb abnormal somatic overgrowth, common in these patients, by effecting epiphyseal closures, a therapeutic hope not established as yet as a fact; (2) to bring about some degree of sexual attractiveness of the patient, which accomplishment affords salutary psychic alterations, and (3) to produce genital growth and development in the hope that the ovaries may become capable of yielding full, normal responses to intrinsic pituitary influences or to those afforded by an adequate gonadotropic therapy.

The use of full substitutional doses of steroids for the sole purpose of regulating the cyclicity of uterine flowing is condemned as being meddlesome and unnecessary. Only when too prolonged or too frequent episodes of uterine bleeding produce a drain on the hemopoietic system is one justified in the employment of an empiric hemorrhagenic-hemostatic schedule of endocrine therapy. The effectiveness of a system of cyclic steroid therapy, embracing the use of estrogens and progesterone, in controlling menometrorrhagia of young women has been established. Any therapy which will permit symptomatic handling of excessive uterine bleeding of young women without impairing their fertility in the future is a valuable one. This fact, however, does not weaken the general statement that, at present, there is too much endocrine therapy of the menstrual cycle and too few attempts at rational endocrine assessments of patients.

In the physiologic hypo-ovarianism of the climacteric, therapy with estrogens is valuable at times in facilitating the hormonal adjustments of a minority of patients. The employment of dosages comparable to those used in complete substitutional therapy is unnecessary and actually harmful if therapy is prolonged. The continued use of these large doses of estrogens can and will delay, and otherwise complicate, the physiologic process of sexual aging. Our progress in geriatrics has not been such that attempts to delay old age are advisable. Troublesome menstrual irregularities and generalized edema due to disturbances in the metabolism of water and electrolytes may follow injudicious estrogenic therapy at this time. Overstimulation of the aging endometrium may enhance the incidence of carcinoma.

All therapy at the climacteric should be in line with the general therapeutic desideratum: to lessen, but not completely substitute for, the physiologic ovarian deficit of those women in whom the secondary hormonal adjustments are proceeding too slowly, i. e. palliative but not full replacement therapy. Estrogenic therapy should be limited in its duration to several months; dosages should be kept small and should be administered orally if possible; if patients have bleeding cycles, therapy should be calibrated with these cycles, estrogens being withdrawn during expected episodes of bleeding lest menstrual irregularities ensue.

Relatively low grades of estrogenic deficiency or moderate degrees of lowered endometrial receptivity may result in incomplete "priming" or vascularization of the endometrium, with the result that minimal or no progestational alterations occur. Such apparent inter-

current ovarian failure may be transformed eventually, owing to possible endometrial functions in steroid metabolism, into more real disturbances of ovarian function, i. e. corpus luteum failure. Some evidence has been presented that cyclic steroid therapy with estrogens and progesterone, or perhaps with estrogens alone, permits therapeutic salvage of patients with functional irregularities of uterine bleeding and endocrine sterility related to these etiologic factors. In these instances, therapy may be regarded as being complementary: ovarian function is complementary until such time that spontaneous adjustment can be made.

ESTROGENIC THERAPY OF LOCAL HYPOPLASIAS

Generalized hypoplasia of the sexual system is characteristic of severe estrogenic failure originating during adolescence and, likewise, distinct regressional alterations in the genital apparatus are associated with intercurrent estrogenic failure during the adult period. When, however, sexual hypoplasia is limited to a particular organ or organs, as the uterus or breasts, in women otherwise well feminized, it is found usually that the end organs and not the ovaries are at fault. Intensive estrogenic therapy designed to develop these hypoplastic organs is usually unsuccessful and may result in damage to intrinsic ovarian function. In a number of women who exhibited no evidence of ovarian deficiency except rudimentary uteri we have been unable to demonstrate any uterine enlargement from injections of estradiol benzoate or dipropionate in daily doses as large as 15,000 rat units for as long as three months. Similar experiences have occurred in the treatment of unilateral hypomastia with estrogenic ointments.

When, however, a patient with typical adolescent hypo-ovarianism is concerned chiefly by the cosmetic limitations imposed by the associated hypomastia, gratifying temporary results, and some permanent benefit due chiefly to massage, may be obtained from the local use of estrogenic ointments. This method of administration of estrogens permits concentrations of the dosage at the site of desired action. All the effects obtained from the inunction of estrogenic ointments are not local, however, as 1 of our cases illustrates:

A woman aged 24 years had the typical body build of well defined adolescent hypo-ovarianism and her uterus was of almost rudimentary proportions. She had never experienced uterine bleeding. The nightly inunction of a drachm (4 Gm.) of ointment containing 3,000 rat units of estradiol benzoate into the skin about each juvenile breast not only resulted in mammary hyperplasia but also, after three months of therapy, sufficient uterine hyperplasia had occurred to permit the patient's first episode of uterine bleeding.

ESTROGENIC THERAPY DESIGNED TO DEPRESS HYPERACTIVITY OF OTHER GLANDS

Theoretically, intensive estrogenic therapy should be of value in depressing hyperfunctional states of the anterior pituitary and in overriding virilizing effects produced by hyperactivity of the androgenic elements of the adrenal. While it is believed generally that large doses of estrogens are capable of depressing the moderate hyperactivity of the endocrinotropic influences of the pituitary which characterize climacteric failure of the ovaries, clinical experience has not found this therapy to be of any value in combating hyperpituitary gigantism or the symptoms and signs of pituitary basophilism. Likewise, estrogens have not been demonstrated to be effective in the treatment of hirsutism in general or as endocrine antagonists in virilizing syndromes arising from adrenal disease.

ESTROGENIC THERAPY FOR LOCAL VAGINAL
EFFECTS

Special epithelial effects of estrogens have been adapted to an effective therapy of gonorrheal vaginitis of childhood and to nonspecific postmenopausal vaginitis. In neither of these conditions is the indication for therapy a truly endocrine one, since the hypo-ovarianism and the atrophic state of the vaginal epithelium is normal at these physiologic epochs. Estrogens are used here similarly to any other pharmacologically active agents: their specific action is concerned with vaginal cornification and the production of vaginal acidity, both of which effects an increase in the resistance of the host to the infecting organisms. Dosages of estrogens employed in this therapy can and should be kept low enough to avoid general endocrine effects, such as premature adolescent phenomena in the child or the return of uterine bleeding in the climacteric woman. The fact that treatment is necessary for only six to eight weeks, as a rule, makes it practical and usually free from undesired side effects.

Some gynecologists have employed these vaginal effects of estrogens, usually locally applied, in the pre-operative preparation of postmenopausal women for vaginal procedures. It has been stated that the cornification, vaginal acidity and increased vascularity which result from this therapy have facilitated postoperative healing of the vaginal tissues.

EMPIRIC AND CONTRAPHYSIOLOGIC USES
OF ESTROGENS

A large amount of estrogenic therapy at present is founded only on the empiric association of certain symptoms with the presumed existence of significant ovarian failure. This type of therapeutics, if it employs potent agents in effective doses, is likely to oppose the intrinsic function of ovaries and to upset their hormonal reciprocities with other glands. Two practices in recent organotherapeutics which are employed somewhat widely illustrate what is meant by contraphysiologic usage.

Some workers report good results from intensive estrogenic therapy in instances of "menstrual migraine." Their plan of treatment is to circumvent these headaches by postponing or suppressing menstruation. To this end doses of from 10,000 to 15,000 rat units of estrogen are given daily for from three to four weeks or longer. Menstrual irregularities occur commonly through disturbances produced in the gonadopituitary reciprocities, which are temporary, however, unless therapy is continued for long periods of time.

Many of the recent studies of so-called "idiopathic" or "essential" dysmenorrhea accept the occurrence in this condition of fundamentally normal ovarian function. Some workers have advised the use of repeated injections of estrogens as large as 10,000 rat units every third day for from three to ten doses, beginning these at the end of flowing, to override or inhibit corpus luteum function; relief of dysmenorrhea has been correlated by them with such a contraphysiologic effect. They described the dysmenorrhea as returning, however, quite promptly with the cessation of therapy. This type of treatment seems neither practical nor rational.

SUMMARY AND CONCLUSIONS

Estrogens have a definite, though restricted, role in gynecic therapy. Full substitutional therapy for severe or complete ovarian failure permits striking endocrine responses but has little practical value, since

germinal failure (sterility) is not altered. When therapeutic schedules for estrogenic substitution or complementation are limited in scope and in proposed duration (adolescent ovarian failure and intercurrent episodes of relative ovarian failure producing some irregularities of bleeding and/or endocrine sterility), presently available estrogenic hormones, despite expense, permit practical applications. These hormones, likewise, permit worth while and not too expensive applications in the undesired symptomatology of certain climacteric women and in childhood and senile vaginitis.

Nonhormonal estrogens (of the diethylstilbestrol group), if released by the Food and Drug Administration, would circumvent only one of the therapeutic limitations of estrogens: their relative expense. Being orally active, cheap and highly potent, uncritical use of them by physicians and self medication with them by patients would add, doubtlessly, to an already widespread contraphysiologic and empiric estrogenic therapy.

ANDROGEN THERAPY IN GYNECOLOGY

SAMUEL H. GEIST, M.D.

AND

UDALL J. SALMON, M.D.

NEW YORK

Synthetic testis hormone (testosterone propionate) is being used with increasing frequency in the treatment of a number of functional gynecologic conditions. We have previously reported on its use in the treatment of the menopausal syndrome,¹ functional menometrorrhagia,² dysmenorrhea,³ premenstrual tension,⁴ pain of ovulation and endometriosis, and functional mastopathies.⁵ Our experience with androgens in gynecologic therapy, which extends over a period of more than four years and is based on a series of 422 cases, has convinced us that their use as therapeutic agents has a sound rationale and a well defined place in our endocrine armamentarium. However, like so many other valuable therapeutic agents, their use is not unattended by harmful potentialities unless specific indications are observed and appropriate safeguards employed. Fortunately, the range of biologic effects exerted by these hormones, the threshold of tolerance and the objective criteria for regulating the dosage have been clearly enough defined to warrant recommending their use in the treatment of selected types of gynecologic endocrine disorders.

Here we wish to present our observations of (a) the endocrinologic effects of administration of androgen to women; (b) the therapeutic properties of androgens; (c) the signs and symptoms of overdosage, and (d) the methods that can be used which make it possible to utilize the therapeutic properties of these hormones without inducing the undesirable virilization (arrhenomimetic) effects.

From the Gynecological Service of Dr. Geist and the Laboratories of the Mount Sinai Hospital.

Read before the Section on Obstetrics and Gynecology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

The following pharmaceutical houses supplied the androgens used in this study: Schering Corporation, Bloomfield, N. J., testosterone propionate (Oreton), methyl testosterone (Oreton-M), pregnenolone (Pranone) and Ciba Pharmaceutical Products, Inc., Summit, N. J., testosterone propionate (Perandren) and methyl testosterone (Metandren).

1. Salmon, U. J.: *Proc. Soc. Exper. Biol. & Med.* 37: 488, 1937.

2. Geist, Salmon and Gaines.¹⁴ Salmon, Geist, Gaines and Walter.¹⁵

3. Salmon, U. J.; Geist, S. H., and Walter, R. L.: *Am. J. Obst. & Gynec.* 38: 264, 1939.

4. Geist, S. H.: *J. Clin. Endocrinol.* 1: 154, 1941. Salmon, Geist and Walter.³ Salmon.¹

5. Salmon, Geist and Walter.² Salmon.⁷

MATERIAL AND METHODS

This report is based on the observation of 422 patients who were treated with various androgens, namely testosterone propionate, ethinyl testosterone and methyl testosterone. These cases included normally menstruating women and those presenting a variety of gynecologic disorders, namely functional uterine bleeding, uterine fibromyomas associated with menorrhagia, dysmenorrhea, premenstrual tension, mastalgia, endometriosis and the menopausal syndrome.

METHODS OF ADMINISTRATION

The methods of administration in this series have been (a) intramuscular (testosterone propionate), (b) enteral (testosterone and methyl testosterone), (c) sublingual absorption (testosterone in propylene glycol) and (d) subcutaneous implantation (crystals and pellets of testosterone and testosterone propionate).

Although preliminary investigations were performed with a number of androgens, only three (testosterone, testosterone propionate and methyl testosterone) were found to be sufficiently potent to be effective. Of these, testosterone propionate was found to be the most potent when administered intramuscularly or subcutaneously. The majority of our studies were performed with this compound.

ENDOCRINOLOGIC EFFECTS OF TESTOSTERONE
PROPIONATE IN WOMEN

In our attempt to determine the biologic properties of testosterone propionate, the doses were varied widely. Patients were given individual doses varying from 5 to 100 mg. for periods varying from two weeks to eight months. Total doses ranged from 60 to 3,200 mg. Of the 422 patients in this series, 245 received 300 mg. or less, 85 received doses ranging from 300 to 600 mg. and 92 received from 600 to 3,200 mg. It soon became apparent that the biologic effects induced by testosterone propionate varied, depending on the dosage administered and on the time of the menstrual cycle during which the hormone was given.

Effect of 500 Mg. or More of Testosterone Propionate per Cycle.—Doses of 500 mg. or more per cycle cause (a) inhibition of the gonadotropic hormone activity of the hypophysis;¹ (b) suppression of follicular growth, ovulation and corpus luteum formation;² (c) inhibition of the formation of estrogen and progesterone and excretion of pregnandiol;⁷ (d) suppression of menstruation;⁸ (e) abolition of the normal cyclic endometrial patterns leading to endometrial hypoplasia or atrophy;⁹ (f) involutional changes in the vaginal mucous membrane characteristic of deprivation of estrogens;¹⁰ and (g) virilization phenomena, namely hair growth on the face, extremities and occasionally on the lower part of the abdomen, deepening of the voice and, in some cases, enlargement of the clitoris.

Effect of 300 Mg. or Less per Cycle.—When testosterone propionate is administered in doses of 300 mg. or less during one cycle (approximately twenty-eight days), the inhibitory effects do not usually occur. Men-

struation is not suppressed and the endometrium usually reveals no regressive changes in the microscopic pattern, indicating that the follicular phenomena in the ovary (ovulation and estrogen and progesterone formation) have not been inhibited. The 500 mg. dose per cycle appears to be the approximate threshold for suppressive effects, providing the total dose is distributed during the entire cycle or given during the first ten days of the cycle before the hypophysis has secreted gonadotropin for the current cycle or before the gonadotropin has been able to exert its action on the ovary. Similar amounts of hormone administered during the latter half of the cycle do not suppress the following menstrual period. Experimental studies indicate that the suppressive action of the hormone is achieved by inhibition of the gonadotropic activity of the hypophysis with consequent suppression of ovulation and production of estrogen and progesterone by the ovary.¹¹ It becomes understandable, therefore, why an amount of hormone which is suppressive (500 mg.) during the first two weeks of the cycle (before ovulation has occurred) has no such inhibitory effect on the current menstrual phenomena if administered during the last two weeks of the cycle. It has been found, furthermore, that one can produce the same suppression of menstruation by concentrating a massive dose (approximately 1,000 mg.) during the first five or six days of the cycle.

RELATION OF DOSAGE TO ARRHENOMIMETIC
PHENOMENA

Experimentation with various doses of testosterone propionate revealed the fact that, if menstruation is suppressed by the hormone, patients are likely to notice some hypertrichosis, deepening of the voice and some enlargement of the clitoris. These phenomena have been observed by a number of investigators.¹² Our studies have shown that there is a fairly well defined dosage threshold for these phenomena which, for the average woman, is approximately 500 mg. of testosterone propionate a month. When this monthly dose is exceeded, the incidence of arrhenomimetic phenomena is approximately 21 per cent. Below this dosage level, the incidence of arrhenomimetic effects drops rapidly. When administered in doses of from 250 to 300 mg. a month, the incidence is approximately 1 per cent. Smaller doses (from 50 to 250 mg. a month), in a series of 179 cases, produced none of these arrhenomimetic effects.

THERAPEUTIC PROPERTIES OF TESTOSTERONE
PROPIONATE

A review of the endocrinologic effects resulting from the administration of androgens to cyclic women makes it become clear that there is available in testosterone propionate a substance which has powerful suppressive effects on the entire female endocrine system and, by virtue of this, great therapeutic potentialities. A fact of great significance, which adds to its value as a therapeutic agent, is the range of gradations of biologic effects which appear to be dependent on quantitations of dosage. Thus it has been established that the threshold for suppression of the gonadotropic activity of the hypophysis, with its consequent inhibitory action on

6. Geist, S. H.; Gaines, J. A., and Salmon, U. J.: *Proc. Soc. Exper. Biol. & Med.* 44: 319, 1940.
7. Salmon, U. J.: *J. Clin. Endocrinol.* 1: 162, 1941.
8. Loeser, A. A.: *Lancet* 1: 373, 1938. Papanicolaou, G. N.; Ripley, H. S., and Shorr, Ephraim: *Proc. Soc. Exper. Biol. & Med.* 37: 689, 1938. Gaines, Salmon and Geist.⁹
9. Gaines, J. A.; Salmon, U. J., and Geist, S. H.: *Proc. Soc. Exper. Biol. & Med.* 38: 779, 1938. Geist, Salmon and Gaines.¹⁴ Salmon, Geist and Walter.¹⁵ Geist, Salmon, Gaines and Walter.¹¹
10. Salmon, U. J.; Walter, R. L., and Geist, S. H.: *Proc. Soc. Exper. Biol. & Med.* 39: 467, 1938. Shorr, Ephraim; Papanicolaou, G. N., and Stimmel, F.: *Endocrinology* 38: 759, 1939. Papanicolaou, Ripley and Shorr.⁸ Geist, Salmon, Gaines and Walter.¹¹

11. Geist, S. H.; Salmon, U. J.; Gaines, J. A.; and Walter, R. L.: *Biologic Effects of Androgen (Testosterone Propionate) in Women*, *J. A. M. A.* 114: 1539 (April 20) 1940. Salmon (footnotes 1 and 7).
12. Foss, G. L.: *Lancet* 1: 992, 1938. Greenhill, J. P., and Fried, S. C.: *Virilism in Women Caused by Androgenic Therapy for Menstrual Disorders*, *J. A. M. A.* 112: 1573 (April 22) 1939. Mazer, C., and Mazer, M.: *Endocrinology* 24: 599, 1939. Geist, Salmon and Gaines.¹⁴ Salmon, Geist, Gaines and Walter.¹⁵ Salmon, Geist and Walter.¹¹ Huffman.²²
man.⁷ Geist, Salmon, Gaines and Walter.¹¹

the ovary and its hormone production, is approximately from 500 to 600 mg., administered during one cycle. The administration of androgens in excess of this amount results in the elicitation of arrhenomimetic phenomena, whereas smaller amounts (less than 250 mg.) cause neither suppressive nor arrhenomimetic effects. It is obvious that, to be of any practical value, androgens would have to exercise their therapeutic properties below the threshold for arrhenomimetic effects. Fortunately, this happens to be the case. Although during the course of our studies patients have been given doses in excess of 500 mg., and some as much as 1,800 mg. a month, with consequent development of hirsuties, voice changes and acne, this occurred before the threshold level for arrhenomimetic phenomena was clearly determined. Since then it has been our practice to keep the dosage below this level, and we were gratified to find that androgens have a therapeutic action in doses which are considerably below the threshold for arrhenomimetic phenomena.

ABNORMAL UTERINE BLEEDING

In the past three years several investigators have reported good therapeutic results in functional bleeding obtained with testosterone propionate.¹³ We reported a series of 25 cases in 1938¹⁴ and an augmented series, totaling 45 cases, in 1940.¹⁵ The results in these cases were, on the whole, good as regards the control of the bleeding. Because of the fact that in a number of those cases large doses (350 to 1,000 mg. a month) were given, arrhenomimetic effects developed. In spite of the fact that the hypertrichosis and voice changes subsequently disappeared, the occurrence of these side effects is a serious objection to the use of androgens in gynecology. Fortunately, subsequent studies revealed the fact that functional menorrhagia could be controlled, in the majority of instances, with doses of testosterone propionate which are below the threshold for arrhenomimetic effects.

TABLE 1.—Results in Thirty-Three Cases of Functional Bleeding with Subarrhenomimetic Doses of Testosterone Propionate (150 to 250 Mg. a Month)

	Cases	Percentage
Primary results in 33 cases (during initial course of therapy)		
Normal menses	25	76
Moderate improvement	5	15
Failures	3	9
Late results in 30 cases		
Good therapeutic results without further treatment (periods of observation from 6 months to 3½ years).....	60	
Normal menses	15 cases, 50%	
Hypomenorrhea	2 cases, 7%	
Amenorrhea	1 case, 3%	
Moderate recurrence, 8 cases (within 3 to 6 months) (subsequently controlled with supplementary androgen therapy)	27	
Complete recurrence, 4 cases (within 3 to 6 months).....	13	

The clinical results obtained in the series of cases with doses below the arrhenomimetic threshold are shown in table 1. In the majority of the latter group doses not exceeding 250 mg. a month were given. The primary as well as the later therapeutic results with this

dosage are not quite as good as those obtained by us with larger doses.² Thus, there were only 6.6 per cent failures in a series of 45 cases, in the majority of which the larger doses were given, in contrast to 9 per cent failures and 13 per cent recurrences in the series of 33 cases in which the smaller (subarrhenomimetic) doses

TABLE 2.—Results in Twenty-One Cases of Uterine Bleeding Associated with Fibroids

	Cases	Percentage
Primary results		
Good therapeutic results.....	15	71
Moderate improvement	4	19
Failures	2	10
Late results (follow-up, 3 mo. to 4 yr. in 19 cases)		
Normal menses	7	37
Moderate recurrence (controlled with supplementary androgen therapy).....	4	21
Complete recurrence	8	42
(9 of these were subsequently operated on: 7 were found to have submucous fibroids; 2, adenomyosis)		

were given. The lower percentage of satisfactory therapeutic results obtained with the smaller doses is more than compensated for, however, by the absence of arrhenomimetic effects in these series.

Menometrorrhagia Associated with Fibroids.—The results in this series were not as satisfactory as in the functional group. The primary results were good in the majority; that is, while the patients were receiving the androgen therapy, or for a month thereafter, bleeding was either completely suppressed or was less copious and of shorter duration. Discontinuation of the androgens was followed by complete recurrence of severe bleeding in 48 per cent. The majority of these patients were subsequently found to have either submucous myomas or adenomyosis. Four patients with uterine fibroids (in whom hysterectomy was contraindicated because of cardiovascular disease) have been satisfactorily controlled with small doses of testosterone propionate and methyl testosterone for more than three years.

Limitations of Androgens in the Treatment of Menometrorrhagia.—The value of androgen therapy in the treatment of abnormal uterine bleeding has become more clearly defined since we have had the opportunity of studying its effects in a large series of cases and over a longer period of time. It is quite clear now that this therapy is most effective in the functional type of menorrhagia or menometrorrhagia occurring in women at the premenopausal age. Occasionally in such patients amenorrhea develops which may last for as long as six months or appear to be permanent. In younger women the results are somewhat less satisfactory, recurrence being more frequent. We have found it advisable to forestall recurrences by continuing androgen therapy in small doses for a period of several months after the establishment of normal menstruation. Usually 10 mg. of testosterone propionate, once or twice a week, is sufficient. We have found that oral (methyl testosterone) or sublingual (testosterone propionate in propylene glycol solution) administration serves satisfactorily as supplementary therapy. It is worth remembering that androgens have no cumulative effects as regards the arrhenomimetic phenomena. Apparently, if the hormone is given in small doses (e. g. from 10 to 20 mg. of testosterone propionate weekly, or from 5 to 10 mg. of methyl testosterone daily), it produces none of these effects even if it is continued for many

13. Beclere, C.: Bull. Soc. de gynec. et d'obst. 27: 749, 1938. Greenhill, J. P., and Freed, S. C.: Am. J. Obst. & Gynec. 39: 636, 1940. Abarbanel, A. R., *ibid.* 39: 243, 1940. Sturgis, W. C.; Abarbanel, A. R., and Nader, D. S., *ibid.* 39: 102, 1940. Varangot, J.: Ann. d'endocrinol. 1: 55, 1939. Loeser, S. Foss, G. Geist, Salmon, and Gaines.²⁴ Salmon, Geist, Gaines and Walter.¹⁵ Mazer and Mazer.¹² Huffman.²³ 14. Geist, S. H.; Salmon, U. J., and Gaines, J. A.: Endocrinology 23: 784, 1938. 15. Salmon, U. J.; Geist, S. H.; Gaines, J. A., and Walter, R. I.: Am. J. Obst. & Gynec. 41: 991, 1941.

months. Some of the patients have received these small doses for periods of from six to sixteen months, totaling as much as 930 mg. of testosterone propionate and more than 2,000 mg. of methyl testosterone, without any arrhenomimetic effects or acne.

At this point, we think it important to point out that, although we believe that androgen therapy is effective in certain types of abnormal bleeding, one should not begin androgen therapy before definitely excluding neoplastic disease. It has been our practice to do either an endometrial biopsy or curettage in all cases prior to treatment.

FUNCTIONAL DYSMENORRHEA

Limitations of space do not permit a review of the theories of the etiology of functional dysmenorrhea.

The crux of the problem appears to lie in the fact that dysmenorrhea is not a clinicopathologic entity but rather a symptom complex which may be caused by a number of apparently unrelated factors, acting separately or in combination. In some cases, mechanical factors or intrauterine disease (adenomyosis), may be responsible for the symptoms. Furthermore, it is difficult to evaluate the role played by psychic factors both with regard to the causation of the symptoms and their amelioration. This probably accounts for the wide variety of therapeutic agents that have been found efficacious in the hands of different observers. . . . From all the evidence available, it seems that functional dysmenorrhea is caused by a disturbance in myometrial function which, in all probability, is the result of a lack of integration of the various hormonal factors that normally produce rhythmic painless contractions. Whether this is due to excessive estrogen and/or progesterone stimulation or to a disturbance of their physiologic interrelations, is, at present, not clear. But as a basis for understanding the therapeutic action of testosterone, it is sufficient if we accept the hypothesis that it is some aberration of gynecogen action on the myometrium that is the cause of functional dysmenorrhea. It has been shown that testosterone completely suppresses the contractions of the fallopian tubes¹⁶ and uterus.¹⁷ In smaller doses its suppressive effect is less intense and it probably reduces the excessive and abnormal uterine contractions to a physiologic pattern. Whether testosterone propionate accomplishes this by depressing the reactivity of the myometrium or by modifying or reducing the stimulating action of the estrogens remains, for the present, unknown.⁷

Dosage.—During the experimental stage of our study we treated dysmenorrhea patients with doses varying from 50 to 900 mg. a month, the total dosage varying from 100 to 1,500 mg. In our first series of 30 patients, reported in 1938,³ the majority of the patients received more than 300 mg. a month; several received more than 600 mg. in one month. As a result of the high dosage employed, a number of characteristic arrhenomimetic effects developed. Since then, we have reduced the dosage below the arrhenomimetic threshold and have found that quite satisfactory therapeutic results can be obtained with doses not exceeding 250 mg. a month. Twenty-five mg. twice a week for the duration of one cycle was found sufficient in most instances. It is important not to discontinue the therapy completely as soon as the symptoms are relieved. The dose should be progressively reduced by approximately 25 per cent each month.

Results.—In the series of 30 cases reported in 1938³ there were 4 complete failures and in 4 only partial improvement; 22 cases, or 73 per cent, showed good

primary results. Since then 25 more cases have come under treatment (with doses not exceeding 250 mg. a month), with essentially similar results (table 3). In 18 there was complete relief while under therapy; 4 showed considerable improvement and 3 no improvement. Of the 22 primary successes, 14 were kept on maintenance therapy for from two to three months after the initial course of treatment. This consisted, in the majority, of from 10 to 20 mg. of methyl testosterone, taken by mouth, for fourteen consecutive days, beginning on the twelfth day of the cycle. Twelve of these remained symptom free for periods varying from six to twenty months after discontinuation of the methyl testosterone. In 2 some recurrence of symptoms developed within three months after the methyl testosterone was stopped, with prompt relief after the medication was resumed.

In 8 of the cases with good primary results supplementary androgen therapy was not given. Of these, 5 remained symptom free for the period of observation, which varied from four to sixteen months. In 1 there

TABLE 3.—Results of Treatment in Twenty-Five Cases of Functional Dysmenorrhea with Subarrhenomimetic Doses of Testosterone Propionate

	Cases	Percentage
Primary results		
Completely relieved	18	72
Considerably improved	4	16
Not improved	3	12
Late results in 22 cases with satisfactory primary results (4 to 20 months follow-up)		
(A) 14 with supplementary oral therapy (methyl testosterone) for 2 to 3 months		
12 symptom free for 6 to 20 months after discontinuation of oral therapy		
2 moderate recurrences within 3 months after discontinuation of oral therapy		
(B) 8 without supplementary therapy		
5 symptom free for 4 to 16 months		
1 moderate recurrence after 4 months		
2 complete recurrences within 3 months		

was a moderate recurrence after four months; in 2, complete recurrence within three months after cessation of therapy. One of the latter was satisfactorily controlled with methyl testosterone. Further therapy was not attempted in the other because of an antecedent acne which seemed to be aggravated by the androgens. This case subsequently showed moderate improvement with ethinyl testosterone (pregneninolone).

The recurrence of symptoms after discontinuation of the androgen and their prompt control with the resumption of androgen therapy suggests a replacement phenomenon. Of the 3 patients who were not improved, 2 had hypoplastic uteri and were subsequently treated with estrogens, with complete relief of the dysmenorrhea. The third had chronic adnexitis.

LIMITATIONS OF ANDROGEN THERAPY

The 4 failures in the first series of 30 cases and the 3 in the present series of 25 cases indicate the limitations of androgen therapy. Apparently, in the presence of endometriosis or chronic pelvic inflammatory disease, androgens have little effect in relieving the dysmenorrhea unless used in suppressive doses. The 2 cases of hypoplastic uteri which failed to respond to androgens but were relieved by estrogens point clearly to the advisability of giving estrogens from the beginning in such cases. The finding of a hypoplastic uterus in a patient complaining of dysmenorrhea should contraindicate the use of androgens.

16. Geist, S. H.; Mintz, M., and Salmon, U. J.: *Proc. Soc. Exper. Biol. & Med.* **41**: 556, 1939.

17. Robson, J. M.: *Quart. J. Exper. Physiol.* **26**: 355, 1937. Leonard, S. L.; Sager, V., and Hamilton, J. B.: *Proc. Soc. Exper. Biol. & Med.* **37**: 362, 1937.

It is worthy of note that none of the patients in this series showed hypertrichosis, changes in voice or enlargement of the clitoris.

PREMENSTRUAL TENSION

Premenstrual tension was first described by Frank¹⁸ and attributed by him to hyperestrinemia with low excretion of estrogen. It has been suggested that the syndrome is the result of overstimulation of the autonomic nervous system by the gynecogens, namely the estrogens and/or progesterone.¹⁹ On the basis of this theory, androgens have been used with gratifying results.²⁰ The emotional manifestations of this syndrome and the consequent difficulty of evaluating the role of psychogenic factors in the etiology of the disorder make it almost impossible to estimate the efficacy of the hormone therapy per se. However, the results of androgen therapy are so much more striking and uniform than other forms of treatment that we are inclined to the view that the relief of the symptoms is attributable to the androgens and not to incidental psychotherapy. Furthermore, 2 patients who were relieved with testosterone propionate were subsequently given, without their knowledge, progesterone for two consecutive cycles and, in both instances, the symptoms recurred.

Dosage.—We have found that 25 mg. twice a week, beginning on the twelfth day of the cycle and continued up to the next period, is sufficient in the majority of cases. Cases of severe involvement may require 25 mg. three times a week. The same course should be repeated for two additional cycles. Thereafter, the dose can be reduced to 10 mg. of testosterone propionate, twice a week, or 10 mg. of methyl testosterone a day for several cycles.

PREMENSTRUAL MASTOPATHIES

The premenstrual engorgement of the breasts which occurs normally in women has been shown to be caused by the stimulative effect of estrogens and progesterone on the epithelial elements of the acini and duct, as well as on the vascular elements.²¹ When these phenomena become exaggerated, the result is extremely painful and tender breasts and nipples, frequently associated with tender "lumps." These clinical manifestations of hypergynecogen stimulation should respond to the antigynecogen property of androgens. The effectiveness of androgen therapy has been attested by the reports of several investigators. Good therapeutic results were first reported by Desmarest and Capitain²² and have since been confirmed by others.²³

Dosage.—Twenty-five mg. of testosterone propionate, twice a week, beginning on the twelfth day of the cycle and continued for two cycles, is usually adequate. Supplementary therapy with methyl testosterone (10 mg. daily, beginning on the twelfth day of the cycle) is recommended for several months after the discontinuation of the parenteral therapy.

18. Frank, R. T.: Hormonal Causes of Premenstrual Tension, *Arch. Neurol. & Psychiat.* **26**: 1053 (Nov.) 1931.

19. Of considerable interest, in this connection, is the finding by Hamblen of excessive amounts of pregnandiol in a patient with this syndrome (*Endocrinology* **24**: 269, 1939). See also footnote 7.

20. Salmon, Geist and Walter.⁵ Salmon.⁷ Salmon, Geist, Gaines and Walter.¹⁵

21. Rosenberg, A.: Frankfurt Ztschr. f. Path., **27**: 466, 1922. Lewis, Dean, and Geschickter, C. F.: *Am. J. Surg.* **24**: 280, 1934.

22. Desmarest, E., and Capitain, Mme.: *Presse méd.* **45**: 777, 1937.

23. Douay, M.: *Compt. rend. Soc. franç. de gynéc.* **8**: 165, 1938. Huffman, J.: *Am. J. Obst. & Gynec.* **40**: 675, 1940. Loeser,⁸ Salmon,⁷

POSTPARTUM PAINFUL ENGORGEMENT OF THE BREASTS

In women who do not wish to nurse, these unpleasant symptoms can be prevented by the postpartum administration of testosterone propionate.²⁴ We have obtained satisfactory results by administering 50 mg. of testosterone propionate intramuscularly within a few hours after delivery and 50 mg. daily for two days thereafter. One of us (U. J. S.) had the occasion to note recently, in 2 patients who decided to nurse their babies on the third and fourth days after they had received 150 and 250 mg. respectively, that, although the breasts were not tender or engorged, the patients were able to lactate adequately. We have found methyl testosterone, given orally, in doses of 60 mg. daily for four days as effective as testosterone propionate.

ENDOMETRIOSIS

The rationale for this treatment is based on the fact that the progress of the disease is predicated on the growth-stimulating effects of estrogens and progesterone on the ectopic endometrial tissue. Androgens have, therefore, been recommended in the treatment of the early stages of the disease and postoperatively in those cases in which the ovarian tissue is preserved because of the importance of conserving the reproductive function.⁷ This therapy is manifestly not practical during the advanced stages of the disease. To be of any value, the hormone must be administered in suppressive doses and, in view of the fact that this approaches very closely the threshold for arrhenomimetic phenomena, the dosage should be carefully controlled with vaginal smears.

MENOPAUSE

The first report of the clinical use of androgens in the treatment of the menopausal syndrome was made by Mocquot and Moricard,²⁵ who described slight improvement in the flushes (with as little as a single injection of 5 mg.) but noted intensification of the nervous instability. It has been shown¹ that by administration of large doses of testosterone propionate (815 mg.), the gonadotropic hyperactivity of the hypophysis in a surgical castrate can be inhibited and the symptoms relieved. These clinical and hormonologic observations have since been confirmed.²⁶

Unfortunately, the impression has been created by several clinical reports that testosterone propionate is as effective as estrogen in the treatment of the menopausal syndrome. This is not in agreement with our observations. It is true that in large doses (from 100 to 200 mg. a week, for several weeks), testosterone propionate has an estromimetic effect and can relieve the menopausal symptoms in a considerable number of cases. This is, however, a slow and expensive method of achieving a therapeutic effect which can be obtained more rapidly, completely and inexpensively with estrogens. There are, however, three groups of patients in whom androgen therapy is indicated for the menopausal syndrome: These are patients with menopausal symptoms who are still menstruating or have menorrhagia or metrorrhagia. Administration of estrogens to such

24. Kurzrok, Raphael, and O'Connell, C. P.: *Endocrinology* **23**: 476, 1938. Birnberg, C. H.; Kurzrok, L., and Klor, S. J.: *Am. J. Obst. & Gynec.* **39**: 107, 1940. Salmon.⁷ Geist.⁴ Leonard, Sager and Hamilton.¹⁷

25. Mocquot, P., and Moricard, R.: *Bull. Soc. de gynéc. et d'obst.* **25**: 787, 1936.

26. Nathanson, I. T., and Towne, L. E.: *Endocrinology* **25**: 754, 1939. Birnberg, C.; Kurzrok, L., and Livingston, C., *ibid.* **23**: 243, 1938. Laroche, G.; Simonnet, H., and Bompard, E.: *Compt. rend. Soc. de biol.* **129**: 953, 1938.

patients not infrequently results in aggravation of the bleeding.⁷ The second group consists of patients in whom the symptoms are only partially relieved by estrogens. These patients frequently respond to small doses of androgens (from 10 to 25 mg. a week) as a supplement to the estrogens.⁷ A third group consists of postmenopausal patients who are distressed by the uterine bleeding resulting from estrogen therapy. In these patients, we have found that the combining of androgens with estrogens is effective in controlling the symptoms without inducing bleeding. The optimal ratio varies somewhat in different women. We have found that in the majority of these patients a ratio of estradiol to testosterone of 1:10 by weight (given parenterally) is satisfactory. We have found the vaginal smear useful as a guide in adjusting the ratio to individual needs.

VALUE OF VAGINAL SMEARS IN REGULATING ANDROGEN DOSAGE

During the course of our studies it was observed that the vaginal smears would frequently reveal signs of estrogen deficiency before any clinical evidence of overdosage was noted.²⁷ Making use of this observation, we have found it of value to take vaginal smears each week during the course of the androgen therapy. With the fuchsin stain²⁸ a smear can be stained and read in a few minutes. At the first sign of effect from the androgen in the vaginal smears, androgen therapy should be discontinued.

METHYL TESTOSTERONE

Methyl testosterone has been found to be a therapeutically effective androgen when administered by the oral route. Its biologic and therapeutic properties are similar to those of testosterone propionate.⁷ Per unit of weight, it appears to be approximately one third to one half as effective by mouth as testosterone propionate is when administered parenterally. This compound is absorbed also in effective amounts when administered by inunction to the skin, but this method of therapy is unsatisfactory because of the difficulty in controlling the dose and the annoyance to the patient.

SUBLINGUAL ABSORPTION OF TESTOSTERONE IN PROPYLENE GLYCOL SOLUTION

We have found that estradiol²⁹ and testosterone¹⁵ are absorbed in therapeutically effective amounts if administered sublingually in solution in propylene glycol. The androgen solution contains 25 mg. of testosterone per cubic centimeter of propylene glycol. In order to insure absorption of the hormone, the drops are instilled under the tongue and the patient is instructed not to swallow for five minutes. Preliminary studies have shown that this is an economical method of administering androgens. It is still, however, in an experimental stage.

IMPLANTATION OF CRYSTALS AND PELLETS OF TESTOSTERONE AND TESTOSTERONE PROPIONATE

Loeser³⁰ has reported satisfactory therapeutic results in 6 patients with menometrorrhagia (5 with fibroids; 1 with functional menometrorrhagia) and 2 with chronic cystic mastitis who were given implantations of testos-

terone and testosterone propionate. During the past three years, we have implanted crystals and pellets of testosterone and testosterone propionate in more than 40 patients in weights varying from 50 to 675 mg. We have found this method of administration of androgen of little value for clinical purposes. While there is no doubt that androgens administered by implantation are therapeutically effective, a number of the patients had arrhenomimetic symptoms within a few weeks, necessitating the excision of the pellets. In view of the proved effectiveness of parenteral and enteral administration of androgen and because of the importance of being able to vary the dose in accordance with the patient's response so that the maximum therapeutic effect is obtained without inducing the arrhenomimetic effects, it seems to us that there is hardly any justification for the implantation of androgen.

ETHINYL TESTOSTERONE (PREGNENINOLONE)

Ethinyl testosterone, which is closely related chemically to both progesterone and testosterone, possesses a unique variety of biologic properties. In animals, it has a progestomimetic, some estromimetic and very slight andromimetic action.³¹ It is, furthermore, active when administered orally.

In a series of 28 cyclic women, treated orally with doses varying from 30 to 60 mg. a day over periods of from one to three months, none of the suppressive effects which can be so strikingly produced with testosterone propionate and methyl testosterone were observed. Menstruation was never suppressed and no estrogen deficiency phenomena appeared. Furthermore, in no instance did virilization phenomena develop.³²

When administered orally to postmenopausal women, after adequate priming with estrogens, gestational changes were produced with doses of from 300 to 600 mg., administered over periods of from one to two weeks.³³

In ethinyl testosterone there is available an orally active substance which has a progesterone-like action. We have found it helpful in some cases of dysmenorrhea and premenstrual tension.⁷ It has proved ineffective, in our hands, in controlling functional menometrorrhagia.³⁴ Because of its progestomimetic action, this compound has been recommended in the treatment of threatened abortion.³⁵ Owing to the difficulty of evaluating its effectiveness, the use of ethinyl testosterone in this condition must still be considered as experimental.

COMMENT

The therapeutic effectiveness of androgens appears to stem from the ability (a) to inhibit the gonadotropic activity of the hypophysis, (b) to suppress or decrease estrogen production, (c) to nullify or modify the activity of the gynecogens, (d) to inhibit the proliferative processes in the endometrium and (e) to inhibit the reactivity of the uterine musculature.

As one reviews the complex biologic properties of testosterone propionate one cannot avoid the implication that, in the normal human female, endogenous androgens may have a somewhat similar function to perform.

27. Salmon, Geist, Gaines and Walter.¹⁵ Salmon, Geist and Walter.³ Salmon.⁷ Geist, Salmon, Gaines and Walter.¹¹
28. Salmon, U. J., and Frank, R. T.: *Proc. Soc. Exper. Biol. & Med.* **33**: 612, 1936. Geist, S. H., and Salmon, U. J.: *Am. J. Obst. & Gynec.* **38**: 392, 1939.
29. Salmon, U. J., and Geist, S. H.: *Proc. Soc. Exper. Biol. & Med.* **45**: 766, 1940.
30. Loeser, A. A.: *Brit. M. J.* **1**: 479, 1940.

31. Salmon, U. J., and Salmon, A. A.: *Proc. Soc. Exper. Biol. & Med.* **43**: 709, 1940.
32. Salmon, U. J., and Geist, S. H.: *Proc. Soc. Exper. Biol. & Med.* **45**: 522, 1940.
33. Salmon, U. J.; Walter, R. L., and Geist, S. H.: *Proc. Soc. Exper. Biol. & Med.* **40**: 252, 1939.
34. Gaines, J. A.; Geist, S. H., and Salmon, U. J.: *J. Clin. Endocrinol.* **1**: 554, 1941.
35. Krohn, L., and Harris, J. M.: *Am. J. Obst. & Gynec.* **41**: 55, 1941.

There are a number of observations that support the theory that androgens play a physiologic role in the sex hormone organization of the human female. It has been shown that adult women excrete significant amounts of androgens³⁶ which are chemically identical with the androgens excreted by males, whereas the excretion of androgens before puberty and in old age is extremely small.³⁷ It may be inferred therefrom that androgens play some physiologic role in the sex hormone metabolism associated with menstruation. The demonstrated antigynecogenic properties of androgens in cyclic women and their therapeutic effectiveness in women presenting symptoms attributable to excessive or abnormal gynecogenic stimulation suggest that in normal women androgens have an antigynecogenic function; that normally the androgens and estrogens balance each other; that in certain gynecologic disorders the androgenic influence is defective or deficient (e. g., functional menorrhagia, dysmenorrhea, premenstrual tension) and that in others (e. g., amenorrhea, hypertrichosis) the androgenic influence is dominant. In the light of this theory, the use of androgens in gynecology can be considered as rational substitution therapy.

SUMMARY AND CONCLUSIONS

1. Four hundred and twenty-two women were treated with androgens during a period of five years.

2. Therapeutic effectiveness of androgens stems from their ability (a) to nullify or modify the action of estrogens, (b) to suppress or decrease the production of estrogens by the ovary, (c) to inhibit the proliferative processes in the endometrium, (d) to inhibit the reactivity of the uterine musculature and (e) to inhibit the gonadotropic activity of the hypophysis.

3. Doses of 500 mg. or more a month have a suppressing gonadotropin production by the hypophysis, follicle growth and ovulation, and estrogen and progesterone formation, inducing involutional changes in the endometrium and vaginal mucosa. Doses of this magnitude may induce acne and arrhenomimetic effects, namely hypertrichosis, deepening of the voice and slight enlargement of the clitoris.

4. Androgens exert their therapeutic effects in subarrhenomimetic doses, namely less than 300 mg. a month.

5. Androgens have been found effective in the treatment of (a) functional menometrorrhagia, (b) functional dysmenorrhea, (c) premenstrual tension, (d) premenstrual mastopathies, (e) postpartum engorgement of the breasts and (f) certain types of the menopause syndrome.

6. Androgen therapy has been found of value in less than 50 per cent of the cases in which menometrorrhagia was associated with uterine fibroids. Androgens appear to be of no value if the abnormal bleeding is attributable to submucous myomas.

7. An orally effective androgen is available in the form of methyl testosterone. Testosterone has also been shown to be absorbed in effective amounts when administered sublingually in solution in propylene glycol.

8. Pellet implantations of androgens have been found to be therapeutically effective, but they are not recommended for clinical use because of the greater advantages of parenteral and oral therapy.

9. In the doses recommended, the danger of arrhenomimetic effects (hypertrichosis, deepening of the voice, enlargement of the clitoris) resulting from androgen therapy is practically negligible.

10. A theory is formulated of the physiologic role played by androgens in the sex-endocrine balance of the normal female. In the light of this theory, functional menorrhagia, dysmenorrhea and premenstrual tension may be regarded as manifestations of a disturbance of the androgen-gynecogen balance resulting in an abnormal dominance of the gynecogens. Administration of androgens, in order to restore the normal balance, would, accordingly, appear to be rational therapy.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DR. HAMBLÉN AND DRS.
GEIST AND SALMON

DR. CHARLES MAZER, Philadelphia: Dr. Geist and his associates attempt to formulate a theory as the basis for the marvelous results they obtained with the use of androgens in dysfunctional uterine bleeding, dysmenorrhea and premenstrual tension. They theorize that these three and almost all other dysfunctional gynecologic manifestations are due to a physiologic imbalance in the production of gynecogens and androgens. If this theory was correct, how could substitutive or complementary treatment with androgens relieve permanently so many of the patients? That androgens nullify or modify the activity of the gynecogens on the endometrium is evident from their ability to prevent estrogen-withdrawal bleeding in the castrated Rhesus monkey and human being. This local effect can be obtained in at least 50 per cent of menometrorrhagias of the dysfunctional type with the use of small doses of testosterone propionate, such as a total of 50 to 200 mg. There is, therefore, no need for the use of the large doses which inhibit, though temporarily, the pituitary ovarian mechanism and which are, moreover, too costly for the average patient. Even the smaller doses have, in my experience, evoked temporary masculinizing phenomena in 6 per cent of patients under 40 years of age. How distressing is even slight hypertrichosis to women at any age is well known. Fortunately, dysfunctional uterine bleeding occurring at this age can usually be controlled by other therapeutic measures which are less costly and less likely to produce undesirable by-effects. For these reasons it seems desirable to restrict, except in rare instances, the use of androgens to the premenopausal type of dysfunctional uterine bleeding wherein chorionic gonadotropin and other nonsurgical therapeutic agents are more or less ineffective. Premenopausal dysfunctional uterine bleeding, moreover, occurs at an age when suppression of the menstrual function merely hastens the inevitable and when temporary facial hairiness and hoarseness of the voice are more likely to be overlooked. In my experience both dysmenorrhea and premenstrual tension failed to respond to any appreciable degree to the administration of androgens in total doses of 50 to 200 mg. The remarkable results obtained by the authors with the use of the larger doses are noteworthy. Nevertheless, we must ponder whether these young women would not prefer their ailments to the risk of masculinizing effects, even if there were no other means of relieving their symptoms. The limited indications for estrogen therapy, as outlined by Dr. Hamblén, can be heartily endorsed. The substance has no peer in the realm

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37. Oesting, R. B., and Webster, B.: *Endocrinology* 22: 307, 1938. Nathanson, I. T.; Towne, L. E., and Aub, J. C., *ibid.* 24: 335, 1939. Dorfman, R. I.; Greulich, W. W., and Solomon, C. I., *ibid.* 21: 741, 1937.

of pharmacology for relief of severe menopausal symptoms, if the dosage is initially adequate in quantity and frequency of administration.

Dr. LUDWIG A. EMGE, San Francisco: The authors have discussed the relative merits of *diametrically opposed methods* of treatment of the disturbances of the female sex organs. Dr. Hamblen's topic deals with a method of treatment which has experienced the test of time and therefore can be more readily evaluated than that discussed by Drs. Geist and Salmon. There is no doubt in my mind that estrogenic therapy has an important place in therapeutics. There is, however, grave doubt that it will keep this place unless its use is rigidly governed by physiologic principles. This can be achieved only if the doctor will make an effort to learn to understand the pharmacologic as well as the chemical nature of estrogenic substances, relying more on his own efforts of observation and deduction than on those enthusiastic detail men. The estrogens essentially are of substitutional value. They do not stimulate the ovaries nor do they make better ovaries, and they are not a panacea for all the ills of womankind. All you can expect of them is to take over at least temporarily the duties of the follicular apparatus. They will not correct any progressive deterioration of ovarian function. Their action is purely substitutional as far as we know today. Withdrawal of treatment permits the return of deficiency phenomena; hence their use in the menopause warrants careful study. If, during the period of substitution, other endocrine glands resume a more normal function, resulting in improvement of the general physical state of a woman, it still does not mean that this becomes a permanent state. It therefore is imperative that the use of these substances is regulated by an intelligent application of physiologic principles. Any deviation from this rule debases this therapy to the level of quackery. There is no doubt that ovaries can be damaged, nor is there any doubt that other endocrines can be seriously disturbed. I agree with Dr. Hamblen that the usefulness of estrogens is limited and their use as tonics neither necessary nor economic. Drs. Geist and Salmon have acquainted you with a new therapeutic agent applicable essentially to the same group of disturbances discussed by Dr. Hamblen. Physiologically, the androgens oppose the estrogens and hence promise to be of great value when the action of the natural estrogens is out of control. Drs. Geist and Salmon's large series of observations strongly supports this assumption, and my own observations point in the same direction. However, I feel that the usefulness of the androgens also is limited. Time and usage are necessary to permit proper evaluation of these substances.

Dr. JEAN PAUL PRATT, Detroit: The presentations by Drs. Geist and Salmon and by Dr. Hamblen represent two phases in the evolution of endocrine gynecology: the former, a period of experimental activity; the latter, a critical summary of previous experiments. The use of gonad materials to stimulate sex function goes back to antiquity. In 1849 the science of endocrinology began when Berthold demonstrated normal masculine development of castrated cocks by testicular grafts. In 1889 Brown-Séquard claimed sensational effects from testicular extracts administered to himself. In 1918 Pezard demonstrated development of the comb in capons by the injection of saline extracts of swine testes. Since 1927, when the first active principle of testes was isolated in Koch's laboratory, the field has widened rapidly. Androgens have been extracted from testes of animals and human urine. The chemical structure has been determined. Testosterone has been synthesized from cholesterol. Various compounds of the androgens have been prepared for experimental and clinical application. The effects in different species and in the human being have been compared. The effects at different ages and stages of development in both sexes have been studied. Today, Drs. Geist and Salmon have contributed an excellent comparison of several compounds. Many questions remain to be answered: What is the manner of action of the androgens? How are they utilized in the body? What is the effect on other endocrine glands and the whole organism? Why are androgens excreted in human urine but not in the urine of animals studied? What is the source of androgen in the female? It would seem that, with so many unanswered questions

the study of androgens must be regarded as still in the experimental phase. Dr. Hamblen, in discussing the uses and limitation of estrogens in gynecic practice, is dealing with a much later phase in the evolution of endocrine gynecology. The estrogens have been widely used for many years. By the method of trial and error their limitations are now quite well defined. The story of ovarian therapy begins in 1898 with the assumption of Prenant that the corpus luteum looked like a gland of internal secretion. Therapy has run through the gamut of transplants, desiccated ovary, whole ovary, ovarian residue, all sorts of extracts to chemically pure sterols and finally to diethylstilbestrol, which is chemically unrelated to the estrogens but which has estrogenic action. The literature of the last four decades is replete with reports of successful therapy with each and all the numerous ovarian preparations. The success has been too often proportional to the enthusiasm of the patient and the doctor.

Dr. JAMES B. HAMILTON, New Haven, Conn.: Male hormone substances (androgens) evoke definite responses in the female, and some of these actions have given rise to trial of their usefulness in gynecology. The problem at the moment, though, does not seem to be whether or not androgens evoke certain effects but whether they are the method of choice in management. That is a problem for the gynecologist. My associates and I have been studying the male eunuch and eunuchoid, particularly suitable subjects for study. They receive large doses for long-continued periods, as our desire is that which in the female would be excessive masculinization. With the use of these dosages in men previously lacking in androgens, we are in a position to look for extragenital effects. Of our series of patients, not one man requested treatment solely for any supposed enhancement of sexual capacity, but all state that they are benefited by the greater power of physical endurance. Vascular changes are characteristic, especially in the skin. The basal heart rate of the castrate is also increased when he receives androgens. McCullagh and Kenyon have shown that sufficient medication increases the basal metabolic rate and velocity of blood flow. These facts are mentioned, though they are not more significant than many of the other changes, such as the retention of salt, water and nitrogen described by Kenyon, Thorn and others. To some extent I must agree as to the obnoxious character of the temporary masculinization, but in these adult eunuchoids we have been able to obtain permanent masculinization with regard to only the lowering of the voice. That is the only change largely maintained for years after discontinuation of treatment. With the use of large doses, enlargement of the penis and of the genitalia occurs, but in our experience this tends to decrease after a while. We want to introduce a note of warning regarding the use of androgens in a woman who may be pregnant. This warning would apply also to the use of estrogens during possible pregnancy. Masculinization would not ensue, but there might be hypospadias, perhaps failure of testicular descent and a tendency toward development of female organs. There is indubitable evidence from animal experiments that pseudohermaphroditism can be and is produced by the influence of sex hormones at critical times during pregnancy.

Dr. KARL JOHN KARNAKY, Houston, Texas: We have used androgens in several hundreds of cases in the Menstrual Disorder Clinic at the Jefferson Davis Hospital, Houston. We have used androgens routinely as advocated but have almost discontinued their uses entirely. Androgen is used occasionally in the menopausal patient. It was my good fortune to discover that diethylstilbestrol would stop functional uterine bleeding in five to thirty minutes when given in doses of 25 to 100 mg. into the anterior lip of the cervix. It was also discovered that diethylstilbestrol would cause atrophy of follicular cysts of the ovaries. In my opinion it is almost always retentive cysts of the ovaries that cause functional uterine bleeding, and diethylstilbestrol will eliminate the cause of the bleeding by causing follicular cysts to atrophy. Our clinic has studied more than 500 ovaries after giving androgen (testosterone propionate) and diethylstilbestrol. After giving from 100 to 5,000 mg. of androgen we never could get complete atrophy of all the follicular cysts, while with diethylstilbestrol it required 100 mg. over a period of twenty days to eliminate completely all the

follicular cysts of the ovaries. Diethylstilbestrol has almost eliminated hysterectomies in cases of functional uterine bleeding. We have 700 cases of uterine bleeding in our series, in 500 of which we would previously have done a hysterectomy. We seldom do a hysterectomy just because of uterine bleeding. After more than 5,000 endometrial biopsies which were taken after all the way from 1 to 40,000 mg. of diethylstilbestrol had been given, estrogens, as far as we can observe, do not cause carcinoma. We have also shown that there is no such thing as a bleeding factor because we have produced uterine bleeding in children, and in women who have had radium or roentgen rays. Estrogenic hormones are apparently the bleeding factor.

DR. UDALL J. SALMON, New York: I regret that the impression has been created that androgen therapy in women inevitably results in the development of masculinization. This is an unfortunate misconception, since it creates an unjustified bias against a valuable therapeutic agent. We have treated more than 420 women with androgens for various gynecologic disorders and have encountered some degree of hypertrichosis or hoarseness in about 7 per cent of the cases. This includes those cases which were treated during the early experimental stage of this study, when we were interested in exploring the biologic properties of the androgens. With that end in view we had administered huge doses, in some instances more than 1,500 mg. during one month. Our studies have shown that there is a definite threshold for the induction of these masculinization phenomena, which is about 500 to 600 mg. of testosterone propionate a month. The therapeutic dose is very much below this, varying from 100 to a maximum of 300 mg. a month. There are, however, some individual variations in androgen susceptibility. Brunettes with a slight hypertrichosis appear to be the most susceptible. The average woman with no antecedent hirsuties can be safely given the therapeutic dose without fear of inducing hypertrichosis. We have found that frequently the smaller doses (100 to 200 mg. a month) will achieve satisfactory therapeutic results, particularly in cases of dysmenorrhea, premenstrual tension and mastalgia. With these smaller doses we have encountered no arrhenomimetic effects in over 200 cases. Furthermore, as regards avoiding these arrhenomimetic phenomena, there are certain morphologic signs which indicate androgen saturation. This is determined most simply by the vaginal smear, which can be prepared in a few minutes. The changes in the vaginal cells precede the appearance of the masculinization phenomena, so that the vaginal smears can serve as a simple method of guarding against overdosage. It is also worthy of note that the arrhenomimetic phenomena spontaneously regress after the discontinuation of the androgens. In regard to the danger of carcinogenesis resulting from estrogen therapy, Dr. Geist and I have conducted a study of this problem during the past six years on over 200 patients who had been treated with large doses of estrogens, and during the last two and one-half years on 180 patients who have been implanted with estrogen crystals and pellets. In these cases, periodic biopsies of the endometrium and vaginal mucosa failed to reveal any evidence of any atypical or neoplastic proliferation.

DR. SAMUEL H. GEIST, New York: The questions raised in the discussion are so numerous and so broad that it would be impossible in a short time to attempt even to touch on all of them. There is one thing that I wish to stress, which Dr. Pratt sensed immediately: this work as presented is experimental. After all, there must be some venturesome spirits among us if we are to establish facts therapeutic or physiologic; and we class ourselves as pioneers in this interesting field. It is only after a long series of experiments by many individuals over a period of many years that we shall be able to establish the fact that androgens have a definite place in the treatment of gynecologic disease. It is possible that they will not. Just as the limitations have been put on estrogens so aptly and so correctly by Dr. Hamblen, so shall we eventually be able to evaluate properly the use and therapeutic indication for androgens in gynecology.

DR. E. C. HAMBLÉN, Durham, N. C.: There is only one comment which I should like to add: this is in regard to the so-called carcinogenic role of estrogens. Reference to possible carcinogenic effects by me was only for the purpose of repeating an old clinical warning. It is certain that, in clinical

practice, natural estrogenic hormones have not been given, as yet, in such doses and over such periods of time to justify any serious anxiety in this regard. If some of the various estrogenic chemical substances of the diethylstilbestrol type, however, are made available in commerce, their unsupervised employment, i. e. in self medication, their high potency when taken orally and their cheapness may afford a closer approximation of the conditions which have characterized the production of carcinoma by estrogens in experimental animals. Under these circumstances a real danger may be recognized.

BRONCHIOGENIC CARCINOMA

INCIDENCE IN THE PACIFIC NORTHWEST, WITH A
COMMENTARY ON EIGHTY-FOUR CASES

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AND

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Bronchiogenic carcinoma is so designated because of the widely accepted conviction that all primary pulmonary malignant neoplasms of epithelial origin arise from the bronchi or their accessory glands. Most introductory commentaries describe the investigator's interest as being aroused by his encountering an unusual number of cases of bronchiogenic carcinoma. Such experiences with this serious affliction, until recently regarded as extremely rare, have given impetus to numerous dissertations on the subject in many parts of the world.

In like manner, the abrupt appearance of primary cancer of the lung (in 1926) in our autopsy services aroused our interest, and in 1931 we¹ analyzed the basic pathologic, clinical and radiologic characteristics in 16 cases. Shortly thereafter a visit to the different institutes of pathology in Europe elicited, on inquiry, the interesting fact that the percentage of bronchiogenic carcinoma observed at autopsy was increasing in all these institutes.

The literature contains many contributions to the knowledge of the origin, nature and consequences of this form of cancer. Notable among these have been the monograph by Simons,² the symposium by Halpert³ and the contributions by Ochsner and DeBakey.⁴ The reader is referred to these for a complete review of the literature. However, there remains some question as to the relative or absolute increase of the incidence, the cause, the exact pathologic classifications and the concomitant symptoms. For this reason additional evidence is herewith presented.

INCIDENCE

Simons, after an extensive review, expressed the opinion that there was an increase both relative and absolute. This conclusion has been supported by many subsequent investigators. Rice⁵ stated that there had been a decided increase in the last five years. Vinson⁶ observed a well defined increase ("as frequent as pul-

The pathologists of the Northwest cooperated in this study.
From the Department of Pathology of the University of Oregon Medical School.

Read before the Section on Pathology and Physiology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 5, 1941.

1. Menne, F. R.; Bisailon, Marr, and Robertson, T. D.: *Northwest Med.* **30**: 155 (April) 1931.

2. Simons, E. J.: *Primary Carcinoma of the Lungs*, Chicago, The Year Book Publishers, Inc., 1937.

3. Halpert, Bela: *Surgery* **8**: 903 (Dec.) 1940.

4. Ochsner, Alton, and DeBakey, Michael: *Carcinoma of Lung*, Surg. **42**: 209 (Feb.) 1941.

5. Rice, Carol M.: *J. Lab. & Clin. Med.* **21**: 906 (June) 1936.

6. Vinson, P. P.: *Primary Malignant Disease of the Tracheobronchial Tree: Report of One Hundred and Forty Cases*, *J. A. M. A.* **107**: 258 (July 25) 1936.

monary abscess") during the period 1925 to 1935. Rosedale and McKay⁷ found bronchiogenic carcinoma to constitute 7.5 per cent of all carcinoma, being third in the list. Alwens and his associates⁸ found a decided rise during the last ten years. Mattick and Burke⁹ reported that at the Institute for the Study of Malignant Diseases, of 30,000 persons admitted, showing 18,000 malignant tumors, 73 (1 in every 250) had bronchiogenic carcinoma. This condition occurred with half the frequency of carcinoma of the stomach. A similar comparative observation was reported by Halpert.³ Brines and Kenning¹⁰ also stated that primary malignant tumor of the lung had developed from obscurity to importance, comprising 10 per cent of all cancer in Germany and being second to carcinoma of the stomach, as observed at autopsy in 3,000 cases. Cramer¹¹ quoted Peters as pointing out that the bronchiogenic type of neoplasm has advanced from fifth to second place and that in 1930 it constituted approximately 28.05 per cent of all carcinoma in men. Howes and Schenck¹² found 3 per cent of all carcinoma in the Brooklyn Cancer Institute to

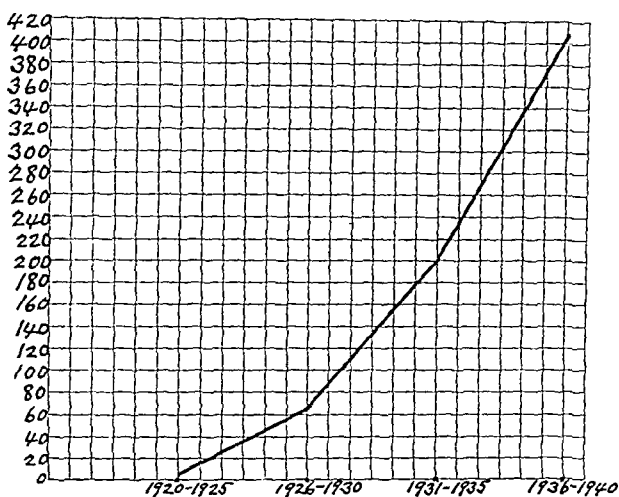


Fig. 1.—Composite curve illustrating the incidence of bronchiogenic carcinoma in the Northwest from 1920 to 1940, as observed at autopsy in 33,945 cases.

be bronchiogenic. Lockwood's¹³ percentage was somewhat greater, being 6 to 8. Lockwood further noted that twenty years ago the condition was diagnosed in only 5 per cent of patients during life, while today it is recognized clinically in 50 per cent. It was his conclusion that carcinoma of the lung is on the increase in spite of the improved methods of diagnosis. A report¹⁴ of the Chicago Tumor Institute for a period of two years revealed a smaller incidence of bronchiogenic carcinoma (1.14 per cent of all malignant tumors). Lovelock,¹⁵ while undecided as to the relative or absolute increase, pointed out that European authors often have expressed the view that the increase is relative and not absolute.

Discordant opinions have been voiced by several authors. Stein and Joslin¹⁶ expressed the belief that

the increase is due to greater diagnostic accuracy but observed that there was a steady increase as compared with the incidence of carcinoma of the larynx and the lip from 1931 to 1936. Brunn¹⁷ reported 488 instances in 192,271 necropsies (0.24 per cent) from 1898 to 1916. Jaffé¹⁸ noted an incidence of 11.47 per cent of all carcinoma, as compared with one of 10.73 per cent observed in an earlier series of autopsies performed in Vienna (1915 to 1918) and concluded that the increase is more apparent than real. Boyd¹⁹ pointed out that carcinoma of the lung is third in frequency, being exceeded only by carcinoma of the stomach and carcinoma of the large bowel. He recorded 53 instances among 4,500 autopsies (1.2 per cent) from 1925 to 1936 and 64 instances among 2,408 autopsies (2.6 per cent) from 1927 to 1937. This author commented that the worldwide character of the increased incidence has been "phenomenal . . . during the last twenty-five years." However, he concluded that the increase is more apparent than real and that it is due to the recognition of pulmonary carcinoma, the increased facilities for diagnosis and the increased number of autopsies. He further asserted that there was a parallelism between the increase of carcinoma of the lung and the increase of other diseases as revealed by vital statistics. He credited to the use of the bronchoscope and roentgen rays the earlier and more frequent recognition of bronchiogenic carcinoma. In addition, Boyd attributed to the inaccuracy of the differential diagnosis of certain types of bronchiogenic carcinoma from such conditions as Hodgkin's disease and lymphosarcoma a false increase in the incidence of carcinoma of the lung. Middleton²⁰ regarded the increased span of life and the "clinical and pathologic diagnostic consciousness" as being in part responsible for the apparent gross increase.

Our own experience in the study of the incidence of bronchiogenic carcinoma has been at variance with the conclusion that the increase is more apparent than real. Accordingly, it was decided to determine the occurrence of bronchiogenic carcinoma in the Pacific Northwest. We therefore sent a questionnaire to the members of the Pacific Northwest Society of Pathologists, requesting the incidence observed at autopsy. An analysis of the returns disclosed that from 1920 to November 1940, 33,945 postmortem examinations were made, revealing a total of 517 instances (1.52 per cent) of primary bronchiogenic carcinoma. Some of these were recognized by biopsy and others by combinations of clinical observations, biopsy and final autopsy. For recording the instances, the 20 years was divided into four five-year periods. During the first period, 1920 to 1925, only 3 instances were recorded, 1 at the University of Oregon Medical School (department of pathology) and 2 at the Good Samaritan Hospital. In the second period, 1926 to 1930, 63 cases were noted; from 1931 to 1935, 201, and from 1936 to 1940, 407. The striking increase in the last period as compared with that in the first is undoubtedly due in part to better diagnostic facilities and the presence of pathologists in institutions which had previously had none except in the Vancouver General Hospital, the University of Oregon Medical School and the Good Samaritan Hospital, where both diagnostic facilities and pathologists were available during the entire twenty years. It is significant, however, that during the last two periods, namely 1931 to 1935 and

7. Rosedale, R. S., and McKay, D. R.: *Am. J. Cancer* **26**: 493 (March) 1936.

8. Alwens, W.; Baule, E. E., and Jonas, W.: *München. med. Wehnschr.* **83**: 485 (Nov. 8) 1936.

9. Mattick, W. L., and Burke, E. M.: Primary Bronchiogenic Carcinoma from Pathologic and Radiologic Points of View. *J. A. M. A.* **109**: 2121 (Dec. 25) 1937.

10. Brines, O. A., and Kenning, J. C.: *Am. J. Clin. Path.* **7**: 120 (March) 1937.

11. Cramer, H.: *Deutsche med. Wehnschr.* **63**: 1259 (Aug. 13) 1917.

12. Howes, W. E., and Schenck, S. E.: *Radiology* **32**: 8 (Jan.) 1939.

13. Lockwood, I. H.: *South. M. J.* **32**: 30 (Jan.) 1939.

14. Report of the Chicago Tumor Institute, April 1, 1938 to March 31, 1940.

15. Lovelock, J. E.: *Brit. M. J.* **2**: 8 (July) 1939.

16. Stein, J. J., and Joslin, H. L.: *Surg., Gynec. & Obst.* **66**: 902 (May) 1938.

17. Brunn, H.: Primary Carcinoma of Lung. *Arch. Surg.* **12**: 475 (Jan. pt. 2) 1926.

18. Jaffé, R. H.: *J. Lab. & Clin. Med.* **20**: 1227 (Sept.) 1935.

19. Boyd, William: *Tr. & Stud. Coll. Physicians, Philadelphia* **6**: 317 (Feb.) 1939.

20. Middleton, W. S.: *Southwestern Med.* **21**: 287 (Sept.) 1919.

1936 to 1940, there was an astounding and sharp rise in the incidence. A composite curve (fig. 1) based on the number of carcinomas occurring in the respective five year periods reveals a striking continuous elevation. It has been argued that the greater knowledge of the disease, the increased facilities for diagnosis and the greater number of autopsies adequately explain the greater number of occurrences throughout the two later periods. To ascertain if this was true we compared the yearly percentage of bronchiogenic carcinoma with the number of autopsies in two of the institutions in which trained pathologists had been present during the twenty years and in which diagnostic facilities were standardized in accordance with the developments of the period. It will

In order to determine the accuracy or inaccuracy of the seemingly convincing data, a further analysis of the incidence was made (fig. 3), based on a segregation of the cases of bronchiogenic carcinoma (in the same two institutions) as observed at autopsy during a particular period, into groups of not less than 20.²¹ From 1928 to 1933 there were performed at the University of Oregon Medical School 3,129 autopsies, disclosing 23 cases of bronchiogenic carcinoma (0.73 per cent); from 1934 to 1937 there were 2,820 autopsies, disclosing 26 cases (0.92 per cent), while from 1936 to November 1940 there were 2,022 autopsies, disclosing 34 cases (1.68 per cent). Comparatively, in the Vancouver General Hospital from 1928 to 1933 there were 2,111

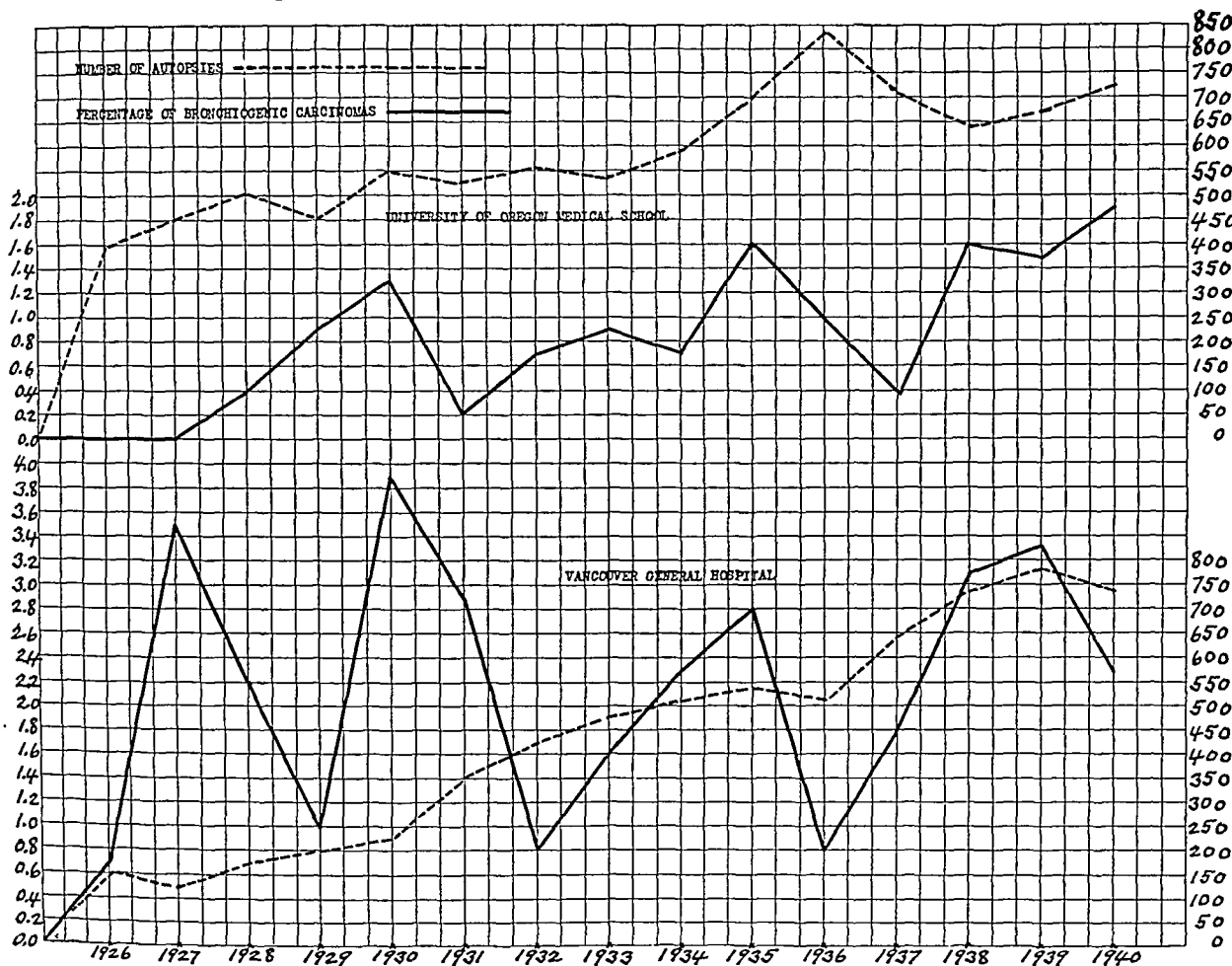


Fig. 2.—Relation of the incidence of bronchiogenic carcinoma to the number of autopsies performed from 1926 to 1940 inclusive.

be noted (fig. 2) that while there was a continuous, steady elevation in the number of autopsies performed throughout the years the percentage of bronchiogenic carcinoma did not parallel the increase in the number of autopsies for a given year and that not infrequently when there was a rise in the number of autopsies there was an actual decrease in the number of bronchiogenic carcinomas. It must be borne in mind that a rising total of autopsies also includes those performed on persons who have died from all causes. Epidemics of influenza or increased numbers of cases of pneumonia and other acute conditions may increase the number of deaths and the percentage of autopsies so that there may be an actual fall in the relative percentage of bronchiogenic carcinoma based on the total number of autopsies performed.

autopsies, disclosing 35 cases of bronchiogenic carcinoma (1.65 per cent), from 1934 to 1937, 2,206 autopsies and 40 cases (1.81 per cent), and in the final period (1938 to November 1940) 2,244 autopsies and 56 cases (2.49 per cent) (fig. 3). There is a striking parallelism in the incidence similar to that seen in figure 2.

The higher percentage at the Vancouver General Hospital in the periods stated may be attributed to less generalization in the performance of autopsies. That is to say, a greater percentage of autopsies may have been performed on all patients with bronchiogenic carcinoma, because of the unusual character of their disease, than

21. In determining the variations due to the laws of chance, as evidenced in a mathematical curve, a reasonably uniform number of not less than 20 must be selected. The greater the number in groupings of this kind, the more accurate is the percentage.

on patients with other conditions, whose death was not due to a malignant tumor. However, the number of cases during these periods at the Vancouver General Hospital was almost twice as great as that at the University of Oregon Medical School. By the same token, the percentage of error in estimating the incidence would be twice as accurate as that used in estimating the inci-

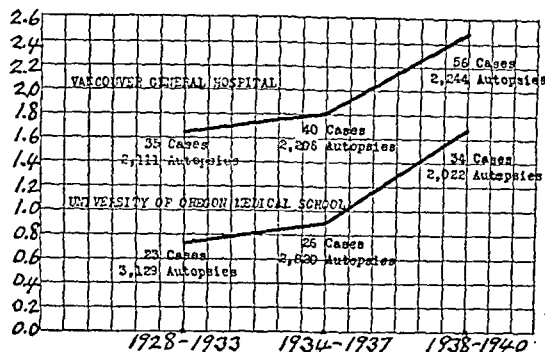


Fig. 3.—Relation of the incidence of bronchiogenic carcinoma to the number of autopsies performed in the University of Oregon Medical School and in the Vancouver General Hospital during three year periods.

dence at the University of Oregon Medical School. Since there is a striking parallelism, the accuracy of the incidence is enhanced. It would seem, therefore, from the preponderance of evidence submitted in reports in the literature as well as from a careful analysis of our own statistics and those available in the Pacific Northwest, that there is both a relative and an absolute increase of bronchiogenic carcinoma.

ETIOLOGY

Since it seems evident that there is an absolute increase, the reason for it becomes of paramount importance. (See Simons² and others for detailed consideration.) The disease may be in such an early stage and so indefinite in its clinical aspects (Middleton²⁰) as to escape detection until therapeutic procedures become extremely difficult. Even when it is recognized in the early stages, radical surgical removal has its dangers both as to mortality and as to altered physiology. All other methods of therapy are still of questionable value. It is accordingly of vital importance to consider the possible causes and to institute proper preventive measures. Unfortunately, study of our own series of cases as well as others yields nothing but speculative opinion as to the possible cause of bronchiogenic carcinoma. Much stress has been laid on the influence of prolonged and severe respiratory infections (e. g. influenza, pneumonia, tuberculosis) by Rice,⁵ Vinson,⁶ Brines and Kenning,¹⁰ Cramer,¹¹ Turner and Willis,²² Dressler and Weigl,²³ Kramer and Som,²⁴ and others. We also have been convinced that any continuous respiratory irritant or infection producing repeated denuding with reepithelization of the bronchial mucosa will either result or aid in the establishment of a malignant pattern.

Contamination of the air in areas of congested traffic and industry is receiving increased attention. Rosedale and McKay⁷ and Dressler and Weigl²³ incriminated chromate dust as provocative in chemical industrial workers. Continued emphasis is being placed on the role of coal dust, chemical agents, radioactive substances

and silicosis in mining and other industries (Charr,²³ Stein and Joslin,¹⁶ Turner and Willis,²² Lockwood,¹³ Lovelock,¹⁵ Lynch and Smith²⁶ and Dressler and Weigl²³).

More recently investigators have turned their attention to the possible influence of the increased use of smoking tobacco (especially the marked increase in the use of cigarettes). Myers²⁷ pointed to the enormous increase in the number of cigarettes consumed in this country. In 1880, 582,718,995 cigarettes were consumed, in comparison with 169,847,245,964 in 1937. Myers noted also that the toxic products of the combustion and distillation of tobacco are carbon monoxide, ammonia, formaldehyde, methylamine, methane, methyl alcohol, hydrogen sulfide, pyridine, furfural, arsenic and hydrocyanic acid. Of these the nicotine and tar contents are thought to be the most harmful. The former is an irritant of mucous membranes and the latter is regarded as carcinogenic. Myers²⁷ stated that "the smoking habits unquestionably increase the liability to cancer of the mouth, throat, esophagus, the larynx and the lungs." Cramer¹¹ noted that habitual smoking producing chronic inflammation of the mouth, pharynx, larynx and bronchial mucosa was present among the steel workers studied by him. In comparing the influence of tobacco smoking with that of the gases coming from automobile exhausts, Cramer¹¹ demonstrated that a 5 Gm. cigar yielded 200 mg. of tar (phenanthrene), while an eight hour drive 10 meters behind an automobile resulted in the collection of only 1.5 mg. of a similar tar. This author appeared to be convinced of

Frequency of Various Symptoms and Signs with the Two Types of Bronchiogenic Carcinoma in Forty-Four of Fifty-Six Cases in Which Autopsy Was Done

Salient Symptoms	Group 1 (Carcinoma of Hilar Nodular Type)		Group 2 (Carcinoma of Diffuse Necrotic Type)	
	Num- ber	Per- centage	Num- ber	Per- centage
Cough.....	8	27.5	4	20.6
Cough with expectoration.....	19	65.5	9	60.0
Hemoptysis.....	14	48.2	3	20.0
Dyspnea.....	18	62.0	6	40.0
Cyanosis.....	4	13.7	2	13.3
Pain.....				
Mediastinal.....	6	20.6	0	0
Pleural.....	1	3.4	7	46.6
.....	1	3.4	0	0
.....	6	20.6	2	13.3
.....	7	24.1	1	6.6
Atelectasis.....	11	37.9	3	20.0
Empyema.....	2	6.9	1	6.6
Pleural effusion.....	5	17.2	5	33.3
Abscess of lung.....	5	17.2	3	20.0
Gangrene of lung.....	2	6.9	3	20.0
Hemothorax.....	0	0	3	20.0
Hoarseness.....	3	10.3	1	6.6
Cerebral and spinal symptoms.....	6	20.6	0	0
Ascites.....	1	3.4	0	0
Weakness and weight loss.....	8	27.5	3	20.0
Pericardium.....	1	3.4	0	0
Hemopericardium.....	1	3.4	0	0
Pancreatic fat necrosis.....	1	3.4	0	0
Lymphatic and venous obstruction.....	2	6.9	0	0
Total cases studied.....	29		15	

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the influence of tobacco smoking in the causation of bronchiogenic carcinoma. Roffo²⁸ stated that "the tobacco tars are very strong cancer producing" agents and that they are in the "same form as the coal tars and certain substances whose properties are very like those of the hydrocarbons distilled out of coal in their fluorescence and their spectrometry." He produced

22. Turner, E. K., and Willis, R. A.: *M. J. Australia* 2: 866 (Nov. 19) 1938.

23. Dressler, M., and Weigl, A.: *Schweiz. med. Wchnschr.* 69: 763 (Aug. 26) 1939.

24. Kramer, R., and Som, M. L.: *Bronchoscopic Study of Carcinoma of Lung*, *Arch. Otolaryng.* 23: 526 (May) 1936.

25. Charr, R.: *Am. J. M. Sc.* 194: 535 (Oct.) 1937.

26. Lynch, K. M., and Smith, W. A.: *Am. J. Cancer* 36: 567 (Aug.) 1939.

27. Myers, J. L.: *Tr. Am. Laryng. A.* 62: 340, 1940.

28. Roffo, A. H.: *Bol. Inst. de med. exper. para el estud. y trat. d. cancer* 15: 406 (Sept.) 1938; cited by Myers.²⁷

cancers by the application of tobacco tars to the ears of rabbits. He pointed out that "one can easily see large opportunity of cancerization in a regular smoker who consumes 1 kilogram of tobacco monthly, which means 70 cc. of tar." In this manner Roffo²⁸ reasoned that "the average smoker loads in one year 840 cc. and in ten years over 8 liters of tar on his buccopharyngo-

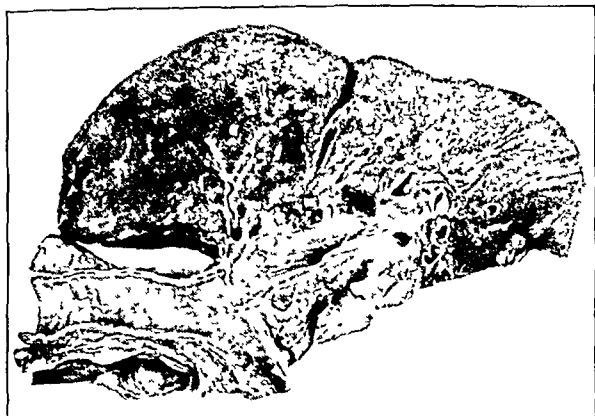


Fig 4—Encasement of the left primary and secondary bronchi by the new growth, hilar nodular bronchiogenic carcinoma

laryngopulmonary membranes, which certainly have not the biologic resistance of the skin of a rabbit." Turner and Willis²² observed bronchiogenic carcinoma in a gold miner who had influenza and smoked $\frac{1}{2}$ pound (226 Gm.) of black tobacco a week.

Certainly the striking predominance of bronchiogenic carcinoma in men as compared with the incidence among women suggests either that in the industries men come in contact with an irritating substance or that the increased consumption (smoking) of tobacco by men as compared with its use by women is of great significance. It would seem that more careful recording of the histories to how much particular persons smoke would be of great value in determining the causal relation of the use of tobacco to bronchiogenic carcinoma. The average inquiry simply elicits information that the patient is or is not a user of tobacco. It is too early as yet to observe in the statistics of the literature the possible influence that tobacco smoking may exert on the incidence of bronchiogenic carcinoma in women, who are now smoking cigarets, often more excessively than do men. A report by Rice,⁶ although it concerned a small number of patients (18 men and 12 women) seemed to indicate an increase among the women.

It seems obvious that the causative agent producing bronchiogenic carcinoma not only is air borne but is in a volatile state, since it involves the two lungs with almost equal frequency. Adequate information concerning correlative inflammatory phenomena in relation to the cause of bronchiogenic carcinoma is not at hand, since the average postmortem examination fails to comb completely the lung structure for initial lesions which might more accurately betray the influence of such phenomena. In the 4 instances of early bronchiogenic carcinoma to be reported by Hunter and his associates,²⁹ there were no clinical or gross pathologic evidences of such lesions. They were accidentally uncovered in the routine selection of lung tissue for histologic study. Here then lies a field that needs more intensive tilling.

At the time fully developed carcinoma of the lung is recognized there is considerable difficulty in defining cause and effect.

PATHOLOGY

In a previous communication we¹ discussed the extrinsic manifestations of the disease in relation to the existence of bronchiogenic carcinoma. At the time we pointed out that in 75 per cent of the instances there was bilateral chronic fibrous pleuritis indicating a previous inflammatory process of some moment. In addition there were acute empyema and other changes due to metastatic extensions in the mediastinum. In the majority of the instances the disease process had progressed so as to produce retraction of the mediastinal structures in the direction of the involved lung.

We were able to determine two more or less definite outstanding macroscopic types. One, in which the major lesions, at least in the less advanced stages, seemed to be that of maximum hilar accumulation, we designated the hilar nodular type; another, in which there was a diffuse involvement with a minimum of hilar concentration, was termed the diffuse necrotic type (figs. 4 and 5). Among 56 cases of bronchiogenic carcinoma in which autopsy was performed the carcinoma was of the hilar nodular type in 35 (62.5 per cent) and of the diffuse necrotic type in 21 (37.5 per cent). Regional pulmonary or lymphatic metastases occurred in all instances. Distant metastases were observed in 45. Whether this gross classification is of value may be open to question. Simons² quoted Aschoff as applying a macroscopic classification as follows: "(1) small nodular masses arising from bronchi of the first to the third order; (2) the infiltrating type in which a large portion of the lung or an entire lobe is involved." Rabin and Neuhoof,³⁰ in a morphologic study of 100 cases (in which autopsy was done), divided bronchiogenic carcinoma into two main types, "circumscribed and noncircumscribed." The foregoing concepts of the pathologic classification of bronchiogenic carcinoma are similar to the one advanced by us in a previous communication.

Our studies led us to conclude that the majority of cancers of the lung arise in the primary and secondary



Fig 5—Diffuse character of the involvement of the lung, diffuse necrotic bronchiogenic carcinoma.

divisions of the bronchi. At autopsy confusion of growth and its consequences make localization difficult. Carcinoma of the so-called diffuse necrotic type in general arises in the more distal bronchi; however, variations in type are not entirely due to location but are in part patterns of a varied pathogenesis. Vinson⁹

²⁹ Hunter, W. C.: Unpublished data.

³⁰ Rabin, C. B., and Neuhoof, H. A.: *J Thoracic Surg* 4:147 (Dec) 1934.

observed primary carcinoma in the trachea in 4 cases and in the bronchi in 87. Kramer and Som²⁴ concluded that 80 to 90 per cent originated in the bronchi, with 20 per cent of "parenchymal" origin. There is unanimity of opinion as to the more or less equal involvement of the lungs with a slightly increased incidence in the right (ratios given are, e. g., 6:4, 20:16 and 38:33). Of the 56 instances observed by us in detail, carcinoma was in the right lung in 28 and in the left in 27. Kramer and Som²⁴ in 100 postmortem examinations found the distribution of bronchiogenic carcinoma to be as follows: in the right lung—main bronchus 18, upper lobe 31, middle lobe 1 and lower lobe 12; in the left lung—main bronchus 8, upper lobe 17 and lower lobe 13. Carcinoma is observed in almost twice as many upper lobes as lower lobes. There is as yet no concrete evidence of bronchiogenic carcinoma's arising from atrial lining cells.

MICROSCOPIC STUDY

Many conflicting views are recorded as to the value and importance of histologic studies from both the academic and the practical point of view. Karsner and Saphir³¹ expressed the opinion that the histologic classification of bronchiogenic carcinoma is the most satisfactory. The observations of Fried³² with respect to the significance of the "reserve" cell type have permeated and influenced the considerations of the histology of bronchiogenic carcinoma. Practically all discussions confirm the existence of definite squamous cell types. The confusion of classification arises in proportion to the degree of anaplasia. Study of the cell structure of the tumors of 56 patients on whom autopsy was done revealed that 31 tumors were distinctly of the squamous cell type, with 9 disclosing keratinization, 15 showing no keratinization and 7 being distinctly anaplastic. Thirteen were found to be of the so-called adenocarcinomatous type, with only 2 showing mucus production. Eight were distinctly of the reserve cell type, 1 of the round cell type and 3 of the spindle or oat-shaped cell type. Again we wish to emphasize, as we did in our previous communication, that epithelial metaplasia with a subsequent malignant formation in the bronchi may result in all of the variable histologic types mentioned. We are of the opinion that with the so-called adenocarcinomatous type, except with growths arising from the mucous glands, the formation of acini is in part dependent on the structure of the lung and is more apparent than real. From the foregoing analysis it is obvious that the more or less confusing types of bronchiogenic carcinoma are decidedly in the minority. We refer in particular to the basal or reserve cell, round cell and spindle cell types. These constitute about 20 per cent of the total. There is, however, no particular confusion in recognizing the distinctly reserve cell type, so that there actually remains less than 1 per cent of primary carcinoma of the lung which may be confused with such lesions as lymphosarcoma. Vinson,⁶ using the Broders method of grading, pointed to its advantage in the application of various kinds of therapeutic irradiation. He concluded that the so-called adenocarcinoma is the most radiosensitive.

PATHOGENESIS

The progressive and subsequent pathologic changes in bronchiogenic carcinoma are obviously primarily dependent on the status quo of lung structure, the

bacterial flora and the site of the initial growth. When neoplasia originates in the primary or secondary bronchi, the direction of growth is, as we¹ have pointed out before, usually in the direction of the lumen. With the type designated by us as hilar nodular, analysis disclosed the sequence to be as follows: (1) hypertrophy, hyperplasia and metaplasia of the epithelium of the bronchus (carcinoma in situ); (2) partial or complete occlusion of the bronchus; (3) extension through the bronchial wall, with excitation of wandering cell infiltration and fibrosis; (4) further extension through the lymphatics; (5) involvement of the hilar lymph nodes, and (6) limited and slow massive extension into the lungs. With this type thromboses, coagulation necroses and secondary infectious processes are late in developing. The so-called diffuse necrotic type appears to us to be a manifestation of a more distant initiation in which the more delicate structure of the bronchus or bronchiole permits easier access to the surrounding lymphatics, with greater obstruction to the circulation. Primary carcinoma of this type appears to progress by (1) hypertrophy and hyperplasia of the epithelium (reserve cell type); (2) early extension into peribronchial lymphatics, with intrapulmonary lymphatic stasis; (3) engorgement and thrombosis of blood vessels; (4) secondary lobular pneumonic infection; (5) diffuse carcinosis; (6) coagulation necrosis with miliary abscess formation; (7) bronchiectasis limited to terminal bronchi, and (8) regional hilar node involvement, occurring in considerably less degree and later in the course of the disease. The carcinosis is characterized by spread through a definite lymphatic distribution in the lung as well as by continuity into tissue spaces. Pleurisy with effusion, because of extension to the pleura, is more frequent with this type. Furthermore, because of the earlier and more diffuse involvement of lymphatics and blood vessels, distant metastases (e. g. to the brain) are more common.

CLINICAL ASPECTS

No attempt will be made in this dissertation to analyze critically the various clinical concepts advanced in the literature by numerous writers. There is, however, universal agreement that the symptoms of bronchiogenic carcinoma are widespread and variable. Most writers on the subject agree that one must recognize two sets of symptoms and signs, those referable to the lungs and those arising from metastases in organs and tissues outside the chest. In our previous communication we attempted to correlate the symptoms, signs and radiologic data characteristic of bronchiogenic carcinoma in general and specifically of two more or less distinctive types (hilar nodular and diffuse necrotic).

In the present series of 84 cases, the average age was 55½ years, with a range of 38 to 77 years. In 78 cases the disease occurred in men and in 6 in women (13 to 1). These data are in agreement with those of the majority of reports. In a number of our cases adequate clinical data were not available, but in 44 of the 56 cases in which autopsy was done they were sufficiently complete to permit comparative evaluation of the signs and symptoms. In 29 of the 44 the carcinoma was of the hilar nodular type, and in 15 it was of the diffuse necrotic type (see accompanying table). An analysis of the salient symptoms and signs disclosed that cough with expectoration was the most frequent symptom, occurring in two thirds of the cases of both types of carcinoma. This was associated with hemoptysis in approximately half of the patients with hilar nodular

31. Karsner, H. T., and Saphir. *Otto*. Am. J. Path. 6: 553 (Sept) 1930.

32. Fried, B. M.: *Primary Carcinoma of the Lung*, Baltimore, Williams & Wilkins Company, 1932.

carcinoma (group 1) but in only 20 per cent of the patients with diffuse necrotic carcinoma (group 2). Dyspnea was the second most common symptom. It was especially severe in group 1 (occurring in 60 per cent) and less pronounced in group 2 (occurring in 40 per cent). Cyanosis was present in 13 per cent of the patients and was frequently stated to be a terminal event. The time and location of the pain were significant in that 20 per cent of the patients of group 1 complained of mediastinal pain characterized as dull, substernal and deep seated. This pain was not present in group 2, but the majority of patients in this group evidenced pleural pain, indicative of metastatic or inflammatory involvement of the pleura. The third type of pain in the chest, which is frequently credited to involvement of the intercostal nerves or roots, was present in only 1 patient of group 1.

In 8 instances the type of pain in the chest was unspecified, and in an equal number pain occurred in locations other than the chest. The pain in all 16 was due to metastatic involvement of organs and tissues evidencing distress.

A significant condition definitely related to the pathogenesis was atelectasis in 38 per cent of the patients with the hilar nodular type (group 1) and in 20 per cent of those with the diffuse necrotic type (group 2). Empyema, pulmonary abscess and gangrene, which are complications due to the extension of the growth and are evidences of secondary infection, tended to be more frequent in the patients of group 2. Hemothorax, in our series, occurred only in patients of group 2 (20 per cent). Hoarseness, stated to be a frequent complication of mediastinal extension, was present in 10 per cent of group 1 and in only 1 patient of group 2. Weakness and loss of weight were common complaints in both groups.

In summary, it may be pointed out that approximately half the patients with hilar nodular carcinoma presented symptoms referable primarily to the lungs, while an equal number had symptoms attributable to metastasis. On the other hand, of the patients with diffuse necrotic carcinoma twice as many had symptoms traceable to metastasis as had symptoms referable to the lungs. It is apparent that symptoms originating in the lungs, such as cough, expectoration and dyspnea, occur more frequently in the earlier stages of the disease and are more common in patients with hilar nodular carcinoma. Conversely, the symptoms and signs resulting from pleurisy, pulmonary abscess, empyema, hemorrhage, dyspnea, cough, hoarseness, aphonia and neurotic involvement are more frequent with diffuse necrotic carcinoma. Apparently the last six symptoms are due to the earlier tendency to metastasize as well as to the earlier obstruction of smaller pulmonary units and their surrounding lymphatics and blood vessels. While there may be some criticism as to the feasibility of the clinical and pathologic division of bronchiogenic carcinoma into the types described, it seems to us that the variability of the initial site of bronchiogenic carcinoma may be expected to and does result in fundamentally different clinical and pathologic pulmonary carcinomatous lesions.

SUMMARY

1. Bronchiogenic carcinoma was observed 517 times during a series of 33,945 autopsies performed in the Pacific Northwest.

2. Statistical analysis based on the number of autopsies, time periods and chance variations indi-

cates an absolute increase in the incidence of primary pulmonary carcinoma in recent years.

3. Emphasis is laid on the etiologic significance of inflammatory processes augmented by volatile irritants, such as tobacco smoke and gaseous products of the industries.

4. Eighty-four instances of bronchiogenic carcinoma were observed in the department of pathology; 78 of the patients were men and 16 women; autopsy was performed in 56 cases.

5. Bronchiogenic carcinomas are classified macroscopically into two types, hilar nodular and diffuse necrotic.

6. Histologic examination of the neoplasm in the 56 cases in which autopsy was done revealed that in 31 it was squamous cell carcinoma, in 13 so-called adenocarcinoma and in 12 reserve cell carcinoma.

ABSTRACT OF DISCUSSION

DR. HOWARD T. KARSNER, Cleveland: Although not always evident, there is value in analysis of the geographic distribution of disease. Climatic, occupational and perhaps dietary and other factors may be different in some respects in the Pacific Northwest from those which prevail elsewhere. It is therefore of interest to learn that bronchiogenic carcinoma is as common in that region as it is in other parts of the country. The authors review again the discussion concerning an increased incidence of this disease. There can be no doubt of a relative increase, but there may well be some question as to absolute increase. The population of the autopsy room is different from the living population, because it is a population determined by numerous factors of opportunity and interest. In ten years at the Cleveland City Hospital, 1927 to 1937 inclusive, bronchiogenic carcinoma constituted 9.4 per cent of all cases of malignant tumor examined at autopsy. No one would claim that about 1 of 10 living patients with malignant tumors has bronchiogenic carcinoma. If autopsy statistics were a guide in this connection it could be said that carcinoma of the lung arising in an obsolete primary tuberculous focus is on the increase because we have seen 3 such instances in the last year as compared with none in the preceding ten years. It is difficult to employ statistical analyses in determining absolute increase because there is no certain way to provide mathematical corrections that would fully account for improved diagnosis, special attention to the lesion, accurate interpretations of roentgenograms and precision of bronchoscopic examinations and biopsy. Nor are the errors inherent in the improved methods fully evaluated. For example, we have seen within a period of six months pneumonectomy in 2 cases not suitable for biopsy through the bronchoscope but characteristic in every way of bronchiogenic carcinoma. One was metastatic from a thyroid carcinoma treated surgically twenty years before and the other metastatic from an unnoticed malignant granulosa cell tumor of the ovary. No formula has yet been devised that meets all the factors of error, largely because these factors are not yet calculable. An absolute increase cannot be denied, nor is it fully established. The influence of various factors supposed to be responsible for an absolute increase is still in doubt. There is certainly no proved connection with epidemics of influenza, nor is there any frequency of association with pulmonary tuberculosis. Silicosis may be of importance but accounts for relatively few cases. Whatever accounts for the Joachimsthal cases does not prevail widely. If tobacco smoking were of significance, there should be an increasing incidence in women.

DR. BÉLA HALPERT, New Orleans: The contribution of Dr. Menne and Dr. Anderson presents evidence that there is a relative as well as an absolute increase in carcinoma of the lung. Their data from the Pacific Northwest on necropsy material are almost identical with those reported by Rosahn from the East and with our own data from the South. Carcinoma of the lung, in fact, is becoming the second if not the first most common malignant neoplasm in the male. Chronic irritations from infections, inhalation of gases, foreign bodies and

particularly smoking of tobacco with its nicotine and tar content may play a part, but perhaps more important is the fact that more people are reaching the cancer age. Whether the gross morphologic classification according to location and extent of the growth as suggested by Dr. Menne and the one by Dr. Karsner have any practical value remains to be seen. At present there are no gross criteria by which the cellular structure can be ascertained without microscopic examination. In looking for effective therapy the cellular structure is a decisive factor. It seems certain that successful radiotherapy of carcinoma of the lung is as yet impracticable. So, for the present, the only effective treatment is early recognition and, as suggested by Graham, Rienhoff, Overholt, Ochsner and DeBailey, Churchill and others, surgical removal of the involved lung—pneumonectomy.

DR. L. WALLACE FRANK, Louisville, Ky.: In my intern days, over twenty-five years ago, cancer of the lung was rare. Today it is exceedingly common. About four years ago I came to the conclusion that the probable cause of the increase of pulmonary cancer was related to the rapid increase in the number of automobiles and the increased use of tarred roads. I intended to work out a series of experiments to prove whether or not this was so but in studying the literature found that Campbell of England had already done the work. He studied mice, in which the known incidence of pulmonary carcinoma was 14 per cent. He took one group as controls and over the others blew twice daily the dust and scrapings from the roadways, most of which were made of some tar preparation. The incidence of pulmonary carcinoma in the second group was 76 per cent, compared with 14 per cent in the controls. I am of the opinion that Campbell's studies throw a great deal of light on the cause of the increase of pulmonary cancer.

DR. ISRAEL DAVIDSOHN, Chicago: When one evaluates all the factors which might have some significance in connection with the question of the absolute or relative increase of carcinoma of the bronchi, it seems worth while to point out the fact that until about 1926 the type of bronchiogenic carcinoma now referred to as reserved cell carcinoma was frequently mistaken for a primary sarcomatous growth of the lymph nodes in the mediastinum. The recognition of the true histogenesis of this tumor must of necessity influence the statistics of bronchiogenic carcinoma. I should like to ask the authors whether they have separated in their series the apical carcinoma originating in the peripheral bronchi, which, owing to its invasion of the bones in the region of the upper thoracic aperture and of the nerves, produces a very characteristic clinical picture (the so-called superior pulmonary sulcus tumor of Pancoast).

DR. FRANK R. MENNE, Portland, Ore.: As far as Pancoast's tumor is concerned, we did not encounter it. We have some papillary carcinomas occurring in association with apical scars that will be reported subsequently. I appreciate that several classifications of carcinoma of the lung have been advanced. Of course, when one deals with statistics one gets into trouble. I want to emphasize, however, again the fact that bronchiogenic carcinoma seems to me to be present out of all proportion to our increased knowledge, either clinically or pathologically, of this incidence, irrespective of the locality. I want also again to emphasize the fact that those carcinomas of the lung that are confused with primary tumors of the lymph in the lymph nodes or the lymphocytes or Hodgkin's disease are a small percentage of the bronchiogenic carcinomas that have been present in our experience.

Lazy Medicine.—That sort of medicine is lazy medicine. It is easier to get the answer out of a machine or out of laboratory reports than to sit down and think for yourself. Or at least the users of the machine think it is. In any event, it satisfactorily puts off until tomorrow, and perhaps forever, the examination you don't want to make today. The machine is made a substitute for thought. Unfortunately it is not invariably the correct answer which comes out; sometimes the machine speaks with the guile of the Delphic oracle, though the hearer does not realize it. And machine medicine may be not only lazy medicine, it may be dishonest medicine.—Atkinson, Miles: *Behind the Mask of Medicine*, New York, Charles Scribner's Sons, 1941.

NORMAL AND ABNORMAL BACTERIAL FLORA OF THE NOSE

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The frequency with which an abnormal bacterial flora was found in cases of frank nasal infection and in the nasal passages of persons without objective changes in the nasal mucosa or subjective symptoms of sinus infection led us to undertake a systematic and comprehensive study of the bacteriology of the nose.

METHODS

The nasal secretion of 500 consecutive patients admitted to our general medical service was cultured. The age of the patients varied from 4 weeks to 78 years. Cultures were made by inserting a sterile swab far back into the nasal cavity and streaking a blood (sheep blood) agar plate directly. Material from each side of the nose was cultured separately. In some cases cultures were made in the same manner with Löffler's medium. Cultures were made of sterilely obtained antral washings by inoculating nutrient broth, dextrose broth and blood agar plates. Cultures thus obtained were incubated at 37.5 C. for twelve to twenty-four hours, and the organisms were then identified by the appearance of the colonies, appropriate staining procedures and bile solubility tests. In many instances, cultures were made repeatedly during the initial hospitalization, return visits of outpatients or readmission.

RESULTS

The organisms found in the nasal passages varied considerably except for the constant presence of *Staphylococcus albus* and diphtheroid bacilli (table 1).

In every instance except 2 in which organisms other than staphylococci, diphtheroid bacilli and *Micrococcus catarrhalis* were isolated on culture from the nasal passages, abnormal changes or conditions existed in the nasal cavity and/or the paranasal sinuses. The 2 exceptions were the only instances in which green-forming streptococci were isolated from the nasal passages and could not be found on repetition of the culture. No abnormalities were demonstrable either clinically in the nasal cavity or by roentgenogram in the paranasal sinuses in these 2 cases. On the other hand, staphylococci and diphtheroid bacilli were found on culture in every case, whether or not there were objective changes in the nasal passages or the paranasal sinuses. Cultures of nasal secretion taken from patients with the "common cold" or an increased nasal discharge from any cause always showed an increase in the number of colonies of staphylococci and diphtheroid bacilli, regardless of what other organisms, if any, might be present. Children with the "common cold" frequently had pneumococci in the culture.

The organisms cultured from material from the nasal passages (other than staphylococci, diphtheroid bacilli and *M. catarrhalis*) were associated with many varied abnormalities of the upper respiratory tract. Sinusitis of the acute purulent, chronic purulent or chronic hyperplastic (nonpurulent) type was the condition most frequently encountered. The cultures of nasal secretion (tables 2, 3 and 4) most frequently showed green-forming streptococci, pneumococci or hemolytic strepto-

cocci. Pneumococci and hemolytic streptococci were found most often in cases of acute sinusitis and green-forming streptococci in cases of chronic sinusitis. In approximately 20 cases green-forming streptococci were recovered from the nasal passages although clinical evidence of sinusitis and frank changes in the nasal mucosa were absent. However, in these cases nonsuppurative (hyperplastic) maxillary sinusitis was shown by roentgen examination. In a few instances green-forming streptococci were recovered from only one nasal passage, with roentgen evidence of sinusitis on the same side.

Hemolytic streptococci were cultured from material from the nasal passages in 15 of the 19 cases of scarlet fever, and occasionally green-forming streptococci were found. Pneumococci were cultured in 2 cases of lobar pneumonia, in one of which there was purulent pansinusitis. Likewise, diphtheria bacilli were cultured from the nasal secretion of 1 patient with clinically diagnosed pharyngeal diphtheria and from that of a diphtheria carrier who had chronic suppurative sinusitis. The latter had, in addition, both green-forming streptococci and hemolytic streptococci in the culture. *Bacillus mucosus* was found on culture in 2 cases of chronic atrophic rhinitis. In 1 of these hemolytic streptococci and pneumococci were also present, and in the other, hemolytic streptococci, diphtheria bacilli and green-forming streptococci. Both patients had a chronic form of maxillary sinusitis. Pfeiffer's bacillus was isolated from the nose in 1 case of clinically diagnosed influenza. Other conditions or lesions in association with which such organisms were found were nasal obstruction due to a markedly deviated septum, with reddened, wet mucous membranes; septal abrasions, and ulcers.

TABLE 1.—Frequency of Various Organisms in Cultures of Nasal Secretion of Five Hundred Patients

Organism	Occurrence	Percentage
<i>Staphylococcus albus</i>	500	100
Diphtheroid bacillus.....	500	100
Green-forming streptococcus.....	104	20.8
<i>Staphylococcus aureus</i>.....	...	7.2
Hemolytic streptococcus.....	36	7.2
.....	35	7.0
.....	6	1.2
.....	3	0.6
.....	2	0.4

TABLE 2.—Abnormal Nasal Flora and Roentgen Evidence of Sinus Disease

Patients with one or a combination of the following organisms in the culture: hemolytic streptococci, green-forming streptococci, pneumococci, diphtheria bacilli, Pfeiffer's bacilli, <i>Bacillus mucosus</i>	161
Number of.....	90
Number of.....	58
Percentage showing sinusitis.....	60.44

Green-forming streptococci or pneumococci were isolated from the antral washings of a number of patients who showed clinical and roentgen evidence of sinusitis.

COMMENT AND REVIEW OF THE LITERATURE

Bacteriology of the Nose.—The flora of the nasal passages has been studied by many observers. In 1898 Park and Wright¹ reported that the normal nose is not usually sterile but that organisms such as pneumo-

cocci and streptococci are rarely found. Neumann² in 1902 studied the nasal flora of more than 200 persons, 111 of whom were supposedly normal, with the results shown in table 5.

None of the patients in Neumann's study had roentgenograms of the paranasal sinuses made.

TABLE 3.—Normal Nasal Flora and Roentgen Evidence of Sinus Disease

Number of patients with normal nasal flora.....	339
Number of roentgenograms of paranasal sinuses.....	181
Number of roentgenograms showing evidence of sinusitis.....	20
Percentage showing sinusitis.....	11

TABLE 4.—Frequency of Organisms in Cases of Roentgenologically Proved Sinusitis in Association with an Abnormal Nasal Flora

Number of cases of an abnormal flora plus roentgen evidence of sinusitis.....	58
Number of cases in which there were green-forming streptococci.....	45, or 77.56%
Number in which pneumococci were found on culture of nasal secretion.....	9, or 15.51%
Number in which hemolytic streptococci were found on culture of nasal secretion.....	4, or 6.8%

Bloomfield³ found that *Staph. albus* was present in every culture of nasal secretion and regarded its presence as a normal condition. Less frequently he found diphtheroid bacilli and *Staphylococcus aureus* and considered gram-negative cocci, *B. lactis aerogenes* and hemolytic streptococci to be transient forms. This view was held essentially by Noble and Fisher⁴ and by Noble and Brainard.⁵ They concluded that organisms such as hemolytic streptococci, green-forming streptococci and pneumococci, of known potential pathogenicity, are clinically significant only in the presence of a definite lesion in the nasal cavity but in the absence of a clinical lesion may be considered transients. According to our experience, whenever these organisms can be cultured from material from the nasal passages, changes in the nasal mucosa or secretion or in the paranasal sinuses are present. Webster and Hughes,⁶ in a study of the epidemiology of pneumococcal infection, expressed the belief that persons from whom pneumococci could be constantly recovered were infected persons in the sense that the organisms were growing in the rhinopharyngeal tissues. These chronic carriers, according to their report, were not given a roentgen examination to determine whether paranasal sinusitis might have accounted for the repeated positive cultures.

Neufeld and Etinger,⁷ in a study on children (aged 1 to 20 months) with acute coryza, found pneumococci in 65 per cent of cultures of nasal secretion. Our observation on children was similar except that pneumococci were found more frequently than green-forming streptococci when there was evidence of an infection of the upper respiratory tract. Shibley, Hanger and

2. Neumann, R. C.: Bakteriologische Untersuchungen gesunder und kranker Nasen, mit besonderer Berücksichtigung des Pseudodiphtheriebacillus. Ztschr. f. Hyg. 40: 33, 1902.

3. Bloomfield, A. L.: Localization of Bacteria in Upper Air Passages, Bull. Johns Hopkins Hosp. 32: 290 (Sept.) 1921.

4. Noble, W. C., Jr., and Fisher, E. A., and Brainard, D. H.: Studies of Acute Respiratory Infections, J. Prevent. Med. 2: 105 (March) 1928.

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Dochez⁸ studied 13 adults between October and June, making cultures of material from the nose and throat weekly when the person was in normal health and daily when a cold occurred. Their observations on the normal nasal flora agree essentially with those of the authors previously cited as well as with our own with respect to the frequency of staphylococci and diphtheroid bacilli. They concluded that gram-negative cocci and nonhemolytic streptococci are occasional transients in the nose but that in the presence of colds hemolytic streptococci and Pfeiffer's bacilli are frequently found. In our series green-forming streptococci and pneumococci were found during colds as frequently as hemolytic streptococci and more frequently than Pfeiffer's bacillus. Wirth and Braun⁹ studied the bacteriology of the nose and throat during acute infections of the upper respiratory tract and concluded that the nasal passages assume a sympathetic role to one another, especially when hemolytic streptococci, pneumococci and influenza bacilli are the causative organisms. This conclusion came as a result of finding the organisms on culture of material from both sites so frequently. Wirth's¹⁰ observations agree essentially with this observation, if one assumes that examination of the nasal bacteria was

TABLE 5.—Nasal Flora of Two Hundred Persons (Neumann²)

Organism	Percentage
<i>Staphylococcus albus</i>	38
<i>Staphylococcus aureus</i>	30
<i>Streptococcus lanceolatus</i>	4
Friedländer's bacillus.....	6
<i>Micrococcus citreus</i>	12
<i>Escherichia coli</i>	12
<i>Streptococcus</i>	2
Molds.....	20
<i>Sarcina</i>	4
<i>Bacillus lactis aerogenes</i>	4
Yeasts.....	2

the easiest method of determining the causative agent of infections of the ear and the upper respiratory tract.

In isolated instances other organisms have been found in cultures of nasal secretion. Meyer and Steenert¹¹ isolated the tubercle bacillus from the purulent nasal discharge at autopsy. Kistner¹² isolated the same organism from the nasal discharge of a person with a primary nasal tuberculoma. Schroeder¹³ found diphtheria bacilli in 39 of 126 cases of chronic atrophic rhinitis and, in a few of these, *B. mucosus*. The diphtheria bacilli were identified by culturing the nasal secretion on Löffler's medium and appropriate Gram staining of the growth. Reference has already been made to our finding diphtheria bacilli in 1 of 2 cases of atrophic rhinitis. Jelin¹⁴ found *B. mucosus* frequently in cases

of atrophic rhinitis but concluded that this organism was not necessarily associated with the rhinitis. On the contrary, Elbert and Guerkess¹⁵ concluded that *B. mucosus* was significant and its presence a relatively constant finding in association with atrophic rhinitis and rhinoscleroma. Mackey¹⁶ reported a study of 85 children suffering from chronic nasal catarrh in whose nasal secretion he frequently found Pfeiffer's bacillus, *Bacillus pertussis* and *B. mucosus*. Miller¹⁷ reported finding gonococci in the nasal secretion of a child with nasal infection and gonorrheal vaginitis. The organisms were identified by finding gram negative intracellular diplococci in the nasal secretion and differentiating them from the meningococcus by appropriate culture methods. Bordet¹⁸ and Moncrieff and Lightwood¹⁹ found *B. pertussis* in the nasal secretion of children with clinically diagnosed whooping cough. Hollender²⁰ and Shulman²¹ isolated Vincent's fusiform bacilli and spirochetes in 2 cases of nasal infection. Fishbein and Staff,²² studying a series of nasal infections, concluded that although staphylococci predominated in the largest number of cultures, the patients with streptococcal infections were the ones showing the most clinical symptoms, such as nasal discharge, obstruction to breathing, headache and lassitude. Tilley²³ studied the bacteriology of purulent nasal discharge and found that the flora was generally mixed but that staphylococci, streptococci and pneumococci were in evidence.

Bacteriology of the Sinuses.—Several observers, Toerne,²⁴ Linton,²⁵ Lewis and Turner²⁶ and Frankel,²⁷ studying clinically normal sinuses at autopsy, agreed that the sinuses are sterile in health. Frankel found that the pneumococcus was the predominant organism in sinuses which showed gross pathologic change. Oaks, Merrill and Oaks²⁸ studied the bacteriology of antral washings and found one or both of the maxillary sinuses sterile in 234 of 475 patients who came to treatment because of what they presumed to be sinus infection. No mention is made of the different types of organisms found, nor were roentgen studies made, but Oaks and his associates concluded that there are bacteria characteristic of sinusitis. Jenssen²⁹ concluded that normal sinuses are sterile but that there are

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no bacteria characteristic of sinusitis. Lederer and Livingston³⁰ and Collet³¹ found the tubercle bacillus in 2 cases of maxillary sinusitis. Jay³² described a case of maxillary sinus infection in which fusiform bacilli and spirilla were isolated. Ersner³³ made cultures in cases of maxillary sinusitis requiring operation and found that hemolytic and green-forming streptococci predominated but were most often found in association with nonsuppurative conditions. Lewis and Turner³⁴ made cultures of material from the antrum in 100 cases of suppurative maxillary sinusitis and isolated Pfeiffer's bacillus in 4, but streptococci, pneumococci and staphylococci predominated. Crowe and Thacher-Neville³⁵ studied 100 cases of paranasal sinus infection. Cultures of antral material taken at operation revealed streptococci (usually green-forming but occasionally hemolytic) to be the predominant organisms but Pfeiffer's bacillus and pneumococci were found occasionally. Babcock³⁶ concluded from culturing antral material that the pneumococcus is predominantly associated with acute sinusitis and green-forming streptococci with chronic sinusitis. Wirth³⁷ cultured material obtained from the antrums of 50 patients with purulent sinusitis. The predominating organisms encountered were Pfeiffer bacilli, hemolytic streptococci and pneumococci, staphylococci being seen but once. Kistner³⁸ studied nonsuppurative or "hyperplastic sinusitis," which he assumed to be a latent stage of sinus infection. Tissues removed from the antrums at operation were ground and washed in sterile sand and cultured. Material from more than 400 sinuses was thus cultured. A mixture of bacteria was usually present, but in 94.5 per cent streptococci were found, of which 35 per cent were hemolytic green-producing streptococci of type A, 14 per cent *Streptococcus viridans* and 18 per cent nonhemolytic streptococci of the gamma type. In addition to and in combination with the streptococci there were found, in order of frequency, staphylococci, *M. catarrhalis*, pneumococci, Friedlander's bacillus, the influenza bacillus, the colon bacillus, diphtheroid bacilli and streptothrices. Contrary to the observations cited, Ashley and Frich³⁹ found *Staph. aureus* more frequently than any other organism in a bacteriologic study of maxillary sinus infections in children.

SUMMARY AND CONCLUSIONS

Cultures of nasal secretion were made as a matter of routine for 500 patients admitted to a general medical service, none of whom had been admitted because of

a primary complaint referable to the nose or the paranasal sinuses.

We find in agreement with most observers that the normal nasal flora consists chiefly of *Staph. albus* and diphtheroid bacilli, with *Staph. aureus* and *M. catarrhalis* less frequently.

Green-forming streptococci and pneumococci are occasional transients in the nasal cavity.

The presence of streptococci, pneumococci, *B. mucosus*, Pfeiffer bacilli and diphtheria bacilli indicates disease of the nasal mucosa or sinus disease or both.

The frequency with which green-forming streptococci, hemolytic streptococci and pneumococci were isolated by culture of nasal secretion in cases of sinusitis, acute or chronic, shows the diagnostic value of this simple, inexpensive procedure.

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KAOLIN GRANULOMA OF THE STOMACH

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AND

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The harmful effects on the human body of silica and certain silicates have been known for many years. While references to the lesions in the lung are numerous and the changes caused by silicates in the muscle, peritoneum and serosa have been described, there have to our knowledge never been recorded the pathologic results of the silica group in the human stomach.

We present herewith a case of granuloma of the stomach which followed ingestion of medication containing colloidal kaolin (hydrated aluminum silicate, $\text{Al}_2\text{Si}_2\text{O}_8 + 5\text{H}_2\text{O}$) together with the results of preliminary experiments in rabbit stomachs using the same medicinal preparation.

PATHOLOGIC CONDITIONS CAUSED BY SILICA AND SILICATES

Silica and certain silicates cause characteristic reactions in tissue. This is a proliferative type of reaction in which there are nodules with mononuclear or giant cells enveloped by a fibrous tissue beyond which are scattered lymphocytes. There is great similarity of the reaction to that produced by the tubercle bacillus. Numerous authors have described this in detail.¹

Gardner,² demonstrating the similarity of lesions produced by silica and the tubercle bacillus, showed that

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Read before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

Dr. Franklin I. Harris, chief of surgery, gave permission to study this case. The pathologic investigations were made under the direction of Dr. G. Y. Rusk, chief pathologist to the Mount Zion Hospital. Mr. John Finn, consulting chemist for the State of California Compensation Insurance Fund and the Newmont Mining Company, collaborated in the mineralogical studies.

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the giant cells which develop in the tissues reacting to silica are not of the ordinary foreign body giant cell type. They resemble the Langhans cell of tuberculosis.

Silica (Si_2O), probably most active in colloidal form,³ produces the typical lesion of silicosis, but certain of the silicates are also active dusts and produce a similar type of reaction.

Notable among these are asbestos and talcum powder, magnesium silicate.⁴

Kettle⁵ has produced lesions using kaolin. By analysis his specimens of kaolin were shown to contain particles of quartz and numerous fibers of sericite (potassium aluminum silicate), the majority measuring 3 microns or less.

Jones, Carleton and Haynes also came to the conclusion that kaolin is a potentially dangerous dust. Whether it is the quartz or the sericite in kaolin which is responsible for the lesions has not been unequivocally determined.⁶

However, Kettle⁵ points out, "with different forms of crystalline silica and with certain silicates essentially the same kind of lesion is produced, such modifications as occur depending on the size of the silica particles and their degree of solubility." Gardner² also agrees that the size of the particle is very important in the type and extensiveness of the lesion produced.

With this knowledge, namely that silica and certain silicates may produce a specific type of granulomatous reaction in various tissues of the body, we may now consider their effect on the gastric mucosa.

REPORT OF CASE

History.—A white man aged 37, an automobile mechanic, had abdominal pain, pyrosis, nausea and vomiting over a period of eight years. He had no permanent relief from various medications or diet. A diagnosis of duodenal ulcer had been previously made, but roentgenographic studies made subsequently were essentially negative. A later diagnosis of colitis had been made erroneously.

Physical examination revealed nothing of significance excepting epigastric tenderness.

The urine, stool, blood count, sedimentation rate and Wassermann reaction were normal. The gastric analysis revealed free hydrochloric acid 68-86 and total acid 77-102.

A gastroscopic examination was made with the 50 degree angle flexible gastroscope. The mucosa of the prepyloric

region was thickened. A gray nodular area approximately 2 cm. in diameter was present on the posterior wall of the antrum immediately distal to the angulus (incisura). This nodule was rounded and irregular; the surface was covered with numerous shiny excrescences (fig. 1).

The rugae of the midportion of the body of the stomach were hypertrophied.

Roentgen examination two days later revealed a mild degree of hypertrophic gastritis and duodenitis. The lung fields were clear.

Despite the essentially negative findings, it was thought that the long history of symptoms and the unusual gastroscopic observations were indications for surgery. A subtotal gastrectomy was done five days later.

Gross examination of the stomach after its removal showed evidence of an old healed duodenal ulcer. No lesion as described gastroscopically was seen, much to our chagrin.

The patient became asymptomatic and has remained so for over two and one-half years.

During the early postoperative period we awaited with anxiety the histologic report.

Microscopic Study.—At the base of the mucosa were a few irregularly spaced lesions of a granulomatous nature. These were made up of nodules of a definite architecture. The center of the nodule contained a large cell which was multinucleated, granular and usually fairly large. The nuclei of many of the giant cells tended to congregate about the periphery.

Encapsulating this cell was a delicate fibrous tissue which was not usually excessive in amount. Beyond the connective tissue might be seen plasma cells, lymphocytes and eosinophilic leukocytes. They were not present in sufficient numbers to constitute a real zone.

In a few of the giant cells there was foreign material (figs. 2 and 3). This varied in size and shape and was colorless and

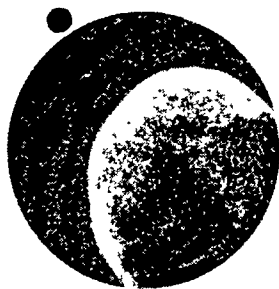


Fig. 1.—Gray nodule covered with numerous shiny excrescences revealed by gastroscopy on the posterior wall of the antrum.



Fig. 2.—Nodular areas near the base of the mucosa. In the central part of the nodules giant cells are present, some of which surround foreign material.

refractile. Some of the particles looked like laminated spicules. Occasionally, fragmented material took a blue stain with hemotoxylin.

Fat, Masson, Kossa and acid-fast stains were negative.

Mineralogical Analysis.—A study was made of the crystals in the giant cells and in the residue of tissue after micro-incineration. They were insoluble in water, hydrochloric acid

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and nitric acid. The crystals varied in size from 2 to 4 microns and belong to the hexagonal system. They were anisotropic or doubly refractive. The Becker line showed them to have a higher refractive index than Canada balsam (1.54). They had the same general morphologic appearance as the crystals present in the colloidal kaolin examined and the crystals present in the preparation used by the patient. They had the characteristics of silica.



Fig. 3.—Type of giant cell typical in silicosis surrounding foreign material. The nuclei tend to congregate around the periphery. The material is fragmented, laminated, colorless and refractile. Some of it stains blue with hematoxylin.

Preliminary Experiments on Rabbits.—With the medicament which the patient had been taking, a test experiment on rabbit stomach was undertaken. The preparation consisted of English kaolin colloidal 20 per cent and aluminum hydroxide 2.5 per cent in liquid petrolatum. We report here the findings of this "scout" experiment.

Two series of animals were tested. In the first series 2 cc. of the medication was injected into the gastric mucosa of 3 rabbits.

In series 2 a small area of the stomach mucosa of 4 rabbits was lightly curetted and the animals were fed daily a diet into which was incorporated powdered colloidal kaolin.

The rabbits of series 1 were killed at one, one and one-half and four months respectively after injection. Gross mucosal elevations or nodules were present. The microscopic examination showed groups of giant cells at the periphery of the injected material.

All the giant cells had multiple nuclei, many of which tended to group themselves peripherally or at the end of the cell like those of a Langhans cell. Colorless refractile crystals were present in many of the giant cells (fig. 4).

In the scarified series the same type of reaction was found; in fact there was greater similarity to the human case in these animals. No gross mucosal lesions were found in these animals. However, there were microscopic changes in the submucosa. Multinucleated giant cells occurred singly or in groups and were encapsulated by a fine loose connective tissue, surrounded by lymphocytes, plasma cells and eosinophilic neutrophils. Some of the giant cells contained foreign material. The most striking particles were sharp pointed clear refractile spicules.

There were giant cells about the suture material, but they were of the true foreign body type, which has little resemblance to the specific kind observed in silicosis.

The foreign material had the colorless glassy refractile appearance which characterized some of the particles of the kaolin which was examined in water suspension under the microscope for comparison.

COMMENT

Evidence has been presented to permit the reasonable conclusion that kaolin may cause a granulomatous inflammatory reaction in the stomach. This reaction is similar to that which is typical of the silica group.

Many unknown factors prevent any additional conclusions. We should like to know the conditions necessary for the silicates to produce this inflammatory reaction in the stomach. We should like to know how common this disease is. If the known reaction to silica and to silicates was accidentally discovered in this 1 case, might it not be reasonable to presume that there may be other undiagnosed cases?

We might perhaps be warranted in suggesting that patients using similar preparations be carefully observed and with the gastroscope. If symptoms should occur suggesting gastrointestinal irritation or if no relief should be obtained from the original symptoms, the possible deleterious effects of this group should be considered.

This case also illustrates the value of gastroscopy followed by tissue studies.

SUMMARY

A histopathologic and mineralogical investigation was made of the stomach of a patient who had been ingesting a preparation containing kaolin for a long period of time. Clinical and roentgen examinations revealed no gastric disease. Gastroscopy showed a prepyloric tumor, which however was not seen in the gross resected stomach. Microscopic studies proved the lesion to be a granuloma, with the type of foreign body giant cell present in the lesions of silicosis. Min-



Fig. 4.—Type of giant cell in the rabbit stomach into which the kaolin containing medication of the patient was injected is large with numerous nuclei at the periphery of the cells. Several colorless refractile crystals are seen.

eralogical studies confirmed the presence of silica in the gastric tissues.

In experimental studies on rabbits it was possible to reproduce the lesions typical of silica irritation which were similar to those found in the human case.

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CLINICAL INDICATIONS FOR INDUCING
GASTRIC HYPOMOTILITY

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The motor activity of the human stomach is of demonstrable clinical significance. This is particularly true in those patients with lesions involving viscera innervated by the extended vagi. Moreover, it appears that the clinical management of certain patients may often be aided by an increased knowledge of stomach activity.

Members of the Surgical Research Department of the Ohio State University have during the past few years investigated the motor activity of the stomach of a large number of patients under a variety of clinical conditions. Using the balloon and kymograph method, we have found that the normal motility is affected not only by disturbances in gastric physiology but also by certain pathologic lesions occurring elsewhere along the gastrointestinal tract.

More recently we have studied alterations in the motor activity which may be observed in patients pre-



Fig. 1.—Effect of atropine (given at 1) on the motility of the normal human stomach and the reversal of this effect by morphine (given at 2). Note the lowered tonus and decreased gastric activity following administration of atropine. Courtesy of Journal of Pharmacology and Experimental Therapeutics.³

sending certain common abdominal complications. Many patients complained of pain or discomfort simultaneously with obvious kymographic evidence of gastric hyper-

In an investigation of the influence of the extrinsic innervation on the motor activity of the human stomach¹ it was concluded that the vagus and splanchnic nerves carry both motor and inhibitory fibers. The effect on the stomach of stimulation of either nerve depends to a certain degree on the existing gastric tonus, although the vagus is chiefly motor while the splanchnic has chiefly an inhibitory effect. Bilateral splanchnic resection was followed by increased gastric activity, which persisted. Left subdiaphragmatic vagotomy was followed by decreased gastric activity, which persisted.

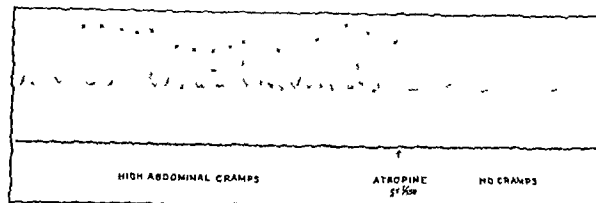


Fig. 2 (B. K., Dec. 7, 1938).—The control of postoperative "gas pains," four days after splenectomy. Severe pains were noted at the peak of the indicated contractions. Coincident with the onset of gastric hypomotility there was complete relief.

Following laparotomy the normal human stomach remains quiescent for from twenty-four to seventy-two hours.² This is followed by gastric hypermotility accompanied by abdominal distress, which is usually interpreted by the patient as "gas pains." The gastric hypermotility persists for about fourteen days postoperatively, but during the latter part of the period the patients often interpret the increased activity as hunger.

The effects of the administration of atropine, morphine and prostigmine were also determined.³ Morphine was predominantly motor. Atropine was constantly inhibitory. Morphine and atropine were mutually antagonistic, either drug counteracting the effect of the other (fig. 1). Prostigmine in the majority of instances inhibited the activity of the human stomach. Moreover, administration of prostigmine or atropine after the previous administration of either drug was uniformly followed by gastric hypermotility.⁴

With these studies as a background we are now investigating the motor activity of the human stomach during the course of common abdominal complications.

TABLE 1.—Analysis of Gastric Motility During Control of the Postoperative Syndrome of "Gas Pains" (B. K.)

Case	Investigation	Type	Length, Min.	Average, Min.	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Min.	Maximum Interval, Min.	Comment
"Gas pains" 4 days postoperative 12/7/38	1 Observation	5	23	32.5	26	8 of 40 to 83 mm.	1	Severe epigastric cramps indistinguishable from "gas pains" noted with indicated contractions
	2. Atropine 1/150 grain intravenously	3	13	15.5	11	8 of 36 mm.	1½	No clinical discomfort during this period of decreased gastric activity

motility. Conversely, the patients ceased to complain of pain or distress when the stomach was demonstrably quiescent, whether that quiescence was spontaneous or induced by the administration of certain drugs. It is our purpose in this paper to present briefly the background of the present studies and then to draw attention to the clinical indications for inducing hypomotility of the human stomach.

From the Department of Research Surgery, Ohio State University. This investigation was aided by a grant from the Development Fund of the Ohio State University.

The Abbott Laboratories, Inc., supplied the intravenous preparations of atropine used in this investigation.

Read before the Section on Gastroenterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

We have continued to use the balloon and kymograph method.⁵ The motility graphs have been analyzed according to the MacQuigg classification.⁶

1 Barron, L. E., and Curtis, G. M.: Effect of Vagotomy on the Gastric Motor Mechanism of Man, *Arch. Surg.* 31: 1132 (June) 1937. Barron, Curtis and Haverfield.⁶

2 Barron, L. E.; Curtis, G. M., and Lauer, Bernard: Influence of Laparotomy on the Gastric Motor Mechanism of Man, *Arch. Surg.* 35: 675 (Oct.) 1937.

3 Veach, H. O.: The Antagonistic Action of Morphine and Atropine on the Human Stomach, *J. Pharmacol. & Exper. Therap.* 61: 230 (Nov.) 1937.

4 Veach, H. O., Lauer, B. R., and James, A. G.: Effects of Prostigmine and Atropine on the Human Stomach, *J. Pharmacol. & Exper. Therap.* 62: 422 (April) 1938.

5 Barron, L. E.; Curtis, G. M., and Haverfield, W. T.: Effect of Bilateral Resection of the Splanchnic Nerves on Gastric Motility in Man, *Arch. Surg.* 32: 577 (April) 1936.

6 MacQuigg, R. E., and Hamilton, F. E.: The Classification of Human Gastric Motility, *Ohio J. Sc.*, to be published.

CONTROL OF POSTOPERATIVE ABDOMINAL CRAMPS INTERPRETED AS "GAS PAINS"

Barron, Curtis and Lauer² observed a consistent period of gastric hypermotility following laparotomy. During the early part of the hyperactive period the patients often complained of "gas pains," although in most instances there was no evidence of abdominal

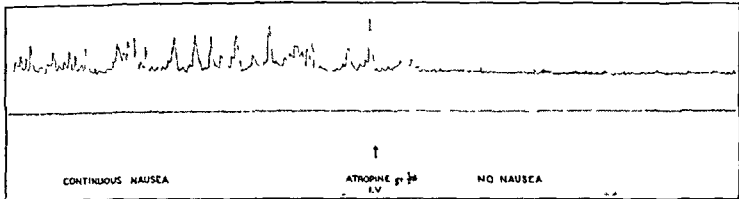


Fig. 3 (K. H., Nov. 10, 1938; esophagopleural fistula; nausea six days following apical thoracoplasty; balloon introduced into stomach through gastrostomy stoma).—Control of late postoperative nausea. Continuous nausea was observed throughout the period of gastric hyperactivity. Coincident with the onset of gastric hypomotility there was complete relief.

distention. We have investigated the gastric motility in such a patient four days following splenectomy. During the period of observation the patient complained of high abdominal cramps, clinically similar to "gas pains." There was no abdominal distention, the wound was clean and there were no demonstrable postoperative complications.

The kymograph records reveal continuous high type 5 contractions. At the apex of each of the higher contractions the patient complained of a severe upper

however, that unusual gastric activities often described clinically as "reverse peristalsis" are a common finding in this condition.

Gastric activity during the course of late postoperative nausea was studied on a patient on whom a gastrostomy had previously been accomplished. Following a second operation the patient remained nauseated for six days. The balloon was introduced directly into the stomach through the gastrostomy stoma with no inconvenience to the patient. The kymograph recorded continuous irregular activity of the stomach consisting largely of type 6 motility (fig. 3). During the entire observation period the patient complained of continuous nausea.

Administration of $\frac{1}{150}$ grain of atropine intravenously was quickly followed by a diminution of gastric activity. Simultaneously with the decreased gastric activity the patient was completely relieved of the sensation of nausea and did not again complain of nausea as long as the stomach was inactive (table 2, fig. 3).

EFFECT OF DUODENAL ULCER WITH OBSTRUCTION ON GASTRIC MOTILITY

A duodenal ulcer may frequently alter the emptying time of the stomach. This is particularly true of obstructive ulcers. However, there has been but little investigation of the relation of the clinical symptoms to abnormal gastric activity in the ulcer patient.

TABLE 2.—Analysis of Gastric Motility During Control of Late Postoperative Nausea (K. H.)

Case	Investigation	Type	Length, Min.	Average, Mm.	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Mm.	Maximum Intervals, Min.	Comment
Nausea 6 days post-operative 11/10/38	1. Observation	6 & 8	33	17	50	2 of 41 to 48 mm.	2	Continuous nausea
	2. Atropine $\frac{1}{150}$ grain intravenously	1 & Q	24	6	5	2 of 10 mm.	20	Complete cessation of nausea

abdominal cramp, clinically indistinguishable from a "gas pain" (fig. 2). Moreover, the intensity of the pain appeared to vary with the amplitude of the recorded contraction.

Immediate partial inhibition of gastric motility was observed following the intravenous administration of $\frac{1}{150}$ grain (0.4 mg.) of atropine. Coincidentally with the decreased gastric activity, the patient was completely relieved of the abdominal cramps and did not again complain of pain or distress during the entire period of reduced activity (table 1, fig. 2).

On this and at subsequent observations symptomatic relief of postoperative abdominal cramps interpreted as "gas pains" was effective as long as the stomach remained quiescent. This period, usually two to three hours in length, was the usual duration of the drug effect.

CONTROL OF LATE POSTOPERATIVE NAUSEA

Postoperative nausea may be immediate or late. Immediate postoperative nausea is frequently observed as the patient recovers from the effects of a general or even of a local anesthetic. It is usually a self-limited condition. Late or prolonged postoperative nausea, however, may be a serious complication and at times indicates a grave physiologic disturbance. The etiology of late postoperative nausea may be so diversified that no single mechanism may be responsible. It appears,

N. U., a white man aged 47, was admitted to the University Hospital with a partial pyloric obstruction due to a benign ulcer of the first part of the duodenum. The patient had been under medical care for the preceding twelve years. Obstructive symptoms had been present for two months before he entered the hospital. Several preoperative gastric motility investigations were accomplished. During these observations it became possible to control the symptoms of "pylorospasm." ⁷ Posterior gastrojejunostomy was then accomplished. A number of postoperative observations have been made.

During one of the preoperative motility studies the balloon was swallowed and the recording started while the patient was complaining of severe cramping epigastric pain that clinically was indistinguishable from the usual symptoms of "pylorospasm." At this time there was obvious kymographic evidence of greatly increased gastric motility, largely type 5 and 8 contractions (table 3, fig. 4).

Following the administration of $\frac{1}{150}$ grain of atropine intravenously, the stomach quickly became hypomotile with an ensuing immediate relief from the distress. Moreover, the patient did not again complain of epigastric pain as long as the stomach was demonstrably quiescent.

At the beginning of another preoperative observation the patient had no pain and was quite comfortable, and the kymograph showed but little gastric activity. Soon spontaneous gastric hypermotility became evident, and coincidentally with the greatly increased type 5 activity the patient complained

7. Hamilton, F. E., and Curtis, G. M.: The Effect of Duodenal Ulcer with Obstruction on the Motor Activity of the Human Stomach, *Rev. Gastroenterol.*, to be published.

of severe cramping pain, clinically indistinguishable from that of "pylorospasm" (table 3, fig. 5).

This period of epigastric pain associated with gastric hypermotility was of short duration and was terminated by a spontaneous remission of the increased gastric activity. Again, cessation of pain occurred simultaneously with the onset of

cystic duct and common duct. Preoperatively the patient had occasional attacks of upper abdominal pain clinically indistinguishable from biliary colic.

During such an attack the motility of the stomach was investigated.⁸ The balloon was passed without

TABLE 3.—Analysis of Gastric Motility During Control of "Pylorospasm" Due to Obstructive Duodenal Ulcer (N. U.)

Case	Investigation	Type	Length, Min.	Average, Mm.	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Mm.	Maximum Intervals, Min.	Comment
"Pylorospasm" preoperative 2/1/39	1. Observation	S & 8	21	33.5	34	2 of 68 to 81 mm.	1½	Continuous severe epigastric cramps indistinguishable from "pylorospasm" Complete cessation of pain
	2. Atropine 1/150 grain intravenously	Q	33	..	..	.....	...
"Pylorospasm" preoperative 2/2/39	1. Observation	Q	10	..	..	.....	...	No subjective pain
		5	10	30	6	1 of 39 mm.	1½	Spontaneous gastric activity
		6M	2	29	7	1 of 56 mm.	0	Severe epigastric cramps indistinguishable from "pylorospasm"
		5M	12	66	13	1 of 116 mm.	1	
		Q	23	..	..	.....	...	Spontaneous gastric quiescence; no subjective pain
		1	23	20	7	1 of 48 mm.	5	

gastric hypomotility and persisted as long as the stomach remained quiescent.

It was found at operation that the patient had a benign, obstructive, duodenal ulcer with a partial pyloric stenosis. Under these conditions intermittent "pylorospasm" is a common clinical finding. It is consequently possible and even probable

difficulty, and continuous type 6 activity was observed (table 4, fig. 6). This irregular type of gastric hypermotility was unchanged throughout an observation period of forty minutes, while during the entire period the patient complained of upper abdominal pain indis-

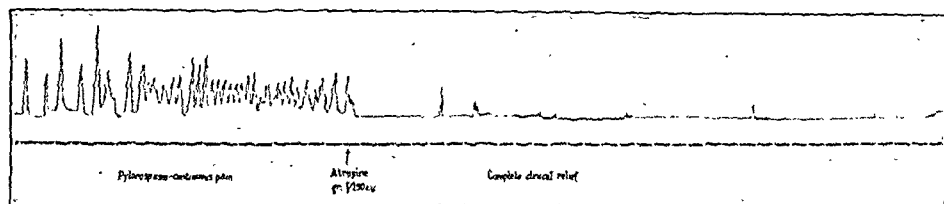


Fig. 4 (N. U., Feb. 1, 1939).—Symptomatic control of "pylorospasm" due to benign obstructive duodenal ulcer. Continuous epigastric pain indistinguishable from that of pylorospasm was noted throughout the initial period of gastric hyperactivity. Complete clinical relief was noted coincident with gastric hypomotility induced by the intravenous administration of atropine.

that the intermittent preoperative epigastric distress experienced by the patient was actually due to "pylorospasm." It cannot be concluded that the preoperative periods of spasmodic gastric hypermotility were kymographic evidences of "pylorospasm."

Biliary colic is thought to stimulate reflexly the stomach by means of the extended vagus (Barber and Stewart,⁹ McCrea¹⁰). Several investigators, Held and Roemer,¹¹ Smith and Miller¹² and others, have shown

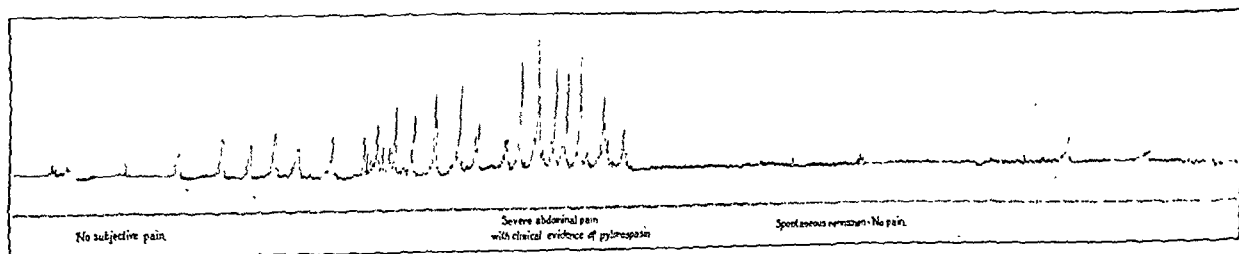


Fig. 5 (N. U., Feb. 2, 1939).—Symptomatic control of "pylorospasm" due to benign obstructive duodenal ulcer. At the beginning the patient felt no pain. Coincident with spontaneous gastric hyperactivity the patient complained of pain indistinguishable from that of pylorospasm. This period was terminated by a spontaneous remission of gastric activity, and throughout the hypomotile period the patient felt no pain.

Since the tube length is kept constant during a given series of gastric motility studies, x-ray studies reveal that the balloon records the activity of the body of the stomach.⁵ It would consequently appear that in this investigation hypermotility of the body of the stomach occurred simultaneously with clinical evidence of "pylorospasm"; moreover, that the patient was free from pain when the stomach was demonstrably quiescent.

EFFECT OF BILIARY COLIC ON GASTRIC MOTILITY

The relation of gastric motility to biliary colic was studied on a patient who at subsequent operation was shown to have cholelithiasis involving the gallbladder,

that disease of the gallbladder, and in particular cholecystitis with cholelithiasis, stimulates gastric activity. The subjective pain in this instance may not have been

8. Hamilton, F. E.: The Clinical Significance of Human Gastric Motility, *Ann. Surg.* **114**: 153 (July) 1941. Barron, Curtis and Lauer.
9. Barber, W. H., and Stewart, G. D.: Further Observations on Reflex Gastric Hypermotility, *Proc. Soc. Exper. Biol. & Med.* **17**: 155, 1919-1920.
10. McCrea, E. D. A.: The Nerves of the Stomach and Their Relation to Surgery, *Brit. J. Surg.* **13**: 621 (April) 1926.
11. Held, I. W., and Roemer, J.: Gastropspasm: A Clinical and Experimental Study, *Am. J. M. Sc.* **164**: 188 (Aug.) 1922.
12. Smith, F. M., and Miller, G. H.: A Study of the Reflex Influence of the Colon, Appendix and Gallbladder on the Stomach, *Am. J. Physiol.* **90**: 518, 1929.

due to gastric hypermotility; nevertheless, the motility of the stomach might be an index of the relative activity of another organ having a similar nerve supply.

CONTROL OF CONTINUOUS NAUSEA AND REGURGITATION ASSOCIATED WITH PARTIAL OBSTRUCTION OF THE STOMACH DUE TO AN ADVANCED CARCINOMA

W. C., a white man aged 70, was admitted to University Hospital complaining of continuous nausea and regurgitation, inability to retain solids or liquids, loss of weight and general

It was found necessary to administer $\frac{1}{400}$ grain (0.6 mg.) of atropine intramuscularly before the patient could swallow the balloon to begin the motility investigation. Thirty minutes later he swallowed the balloon easily, and the kymograph then revealed tremendously increased gastric activity, type 8 associated with continuous nausea and regurgitation (table 5, fig. 7).

An intravenous injection of $\frac{1}{150}$ grain (0.4 mg.) of atropine was followed by little change in the hyperactivity of the stomach or in the clinical symptoms. Again $\frac{1}{150}$ grain of atropine was administered intravenously and was followed by decreased gastric activity associated with considerable clinical relief.

It should be noted that no results were observed until a total of $\frac{1}{43}$ grain (1.5 mg.) of atropine had been administered within a relatively short period of time. Finally the cumulative effect of this large amount of atropine was followed by greatly decreased type 1 motility, and for as long as the hypomotility continued the patient was quite comfortable. When the hyperactivity of the stomach was controlled by the adminis-

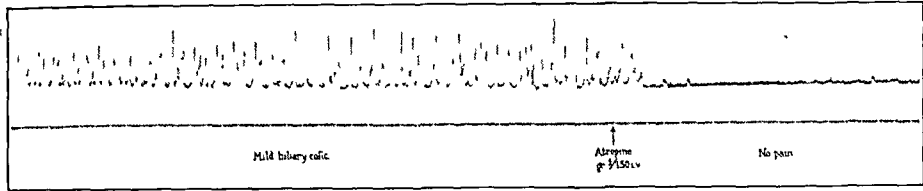


Fig. 6 (N. K., Feb. 6, 1939).—Symptomatic control of biliary colic due to cholecystitis with cholelithiasis. Continuous upper right quadrant pain indistinguishable from that of biliary colic was noted throughout the entire period of gastric hypermotility. Complete clinical relief was noted coincident with gastric hypomotility induced by the intravenous administration of atropine.

debility. A carcinoma which involved practically the entire stomach was later demonstrated at operation. The esophagus and the fundus were not involved in the malignant process.

motility, and for as long as the hypomotility continued the patient was quite comfortable. When the hyperactivity of the stomach was controlled by the adminis-

TABLE 4.—Analysis of Gastric Motility During Control of Biliary Colic (N. K.)

Case	Investigation	Type	Length, Min.	Average, Min	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Min.	Maximum Intervals, Min.	Comment
Biliary colic preoperative 2/6/39	1. Observation	6M	38	40	72	5 of 58 to 68 mm.	$\frac{1}{2}$	Continuous upper right abdominal cramps indistinguishable from biliary colic
	2. Atropine $\frac{1}{150}$ grain intravenously	Q	19	..	..	..	...	No subjective pain

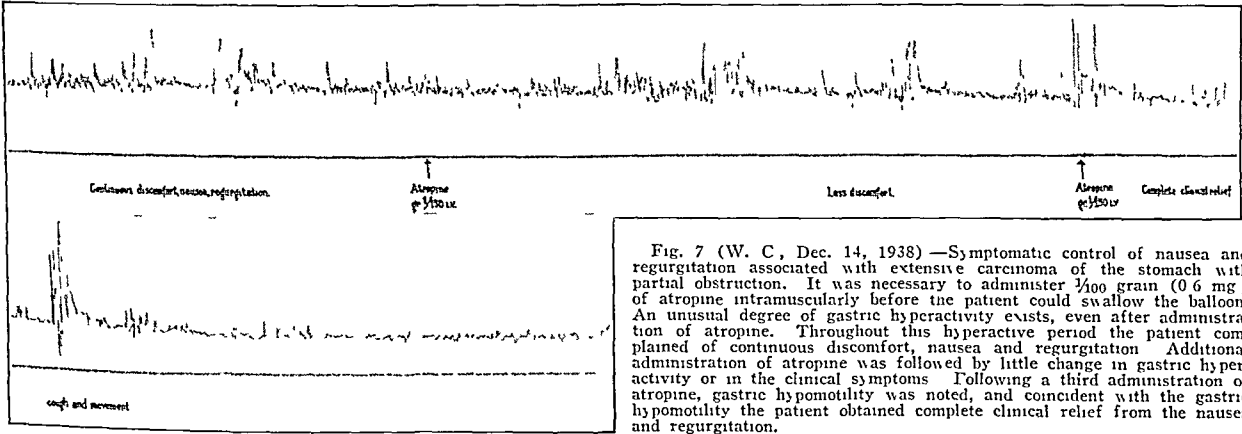


Fig. 7 (W. C., Dec. 14, 1938) —Symptomatic control of nausea and regurgitation associated with extensive carcinoma of the stomach with partial obstruction. It was necessary to administer $\frac{1}{400}$ grain (0.6 mg.) of atropine intramuscularly before the patient could swallow the balloon. An unusual degree of gastric hyperactivity exists, even after administration of atropine. Throughout this hyperactive period the patient complained of continuous discomfort, nausea and regurgitation. Additional administration of atropine was followed by little change in gastric hyperactivity or in the clinical symptoms. Following a third administration of atropine, gastric hypomotility was noted, and coincident with the gastric hypomotility the patient obtained complete clinical relief from the nausea and regurgitation.

TABLE 5.—Analysis of Gastric Motility During Control of Continuous Nausea and Regurgitation Associated with Carcinoma of the Cardia with Stenosis (IV. C.)

Case	Investigation	Type	Length, Min	Average, Min	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Min.	Maximum Intervals, Min.	Comment
Carcinoma of cardia 12/14/38	1. Observation	8	37	13	427	8 of 51 to 56 mm.	0	Continuous nausea and regurgitation; atropine $\frac{1}{150}$ grain administered intramuscularly 30 minutes before start of record
	2. Atropine $\frac{1}{150}$ grain intravenously	8	36	12	330	5 of 53 to 80 mm.	0	Less subjective discomfort
	3. Atropine $\frac{1}{150}$ grain intravenously	1	44	11.3	77	1 of 66 mm.	0	Complete clinical relief

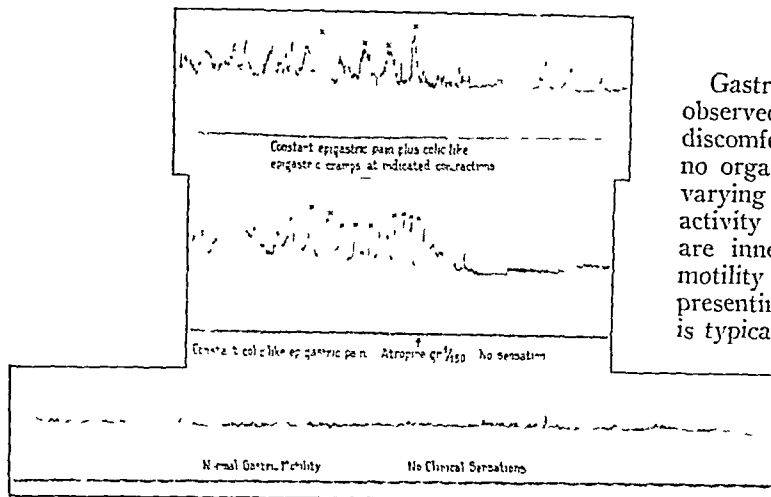


Fig 8 (B. H.).—Control of the abdominal discomfort observed in certain patients with hypothyroidism. During the period of gastric hyperactivity the patient complained of epigastric pain, with severe cramps at the apex of the indicated contractions. When the stomach was quiescent the patient felt no pain. This was true whether the gastric quiescence was spontaneous, as in the first graph (June 20, 1939), occurred following administration of atropine, as in the second graph (June 21) or was observed following adequate thyroid and iodine therapy for the control of hypothyroidism, as demonstrated in the third graph (August 2). (Courtesy of the Journal of Clinical Endocrinology.¹³)

THE RELATION OF GASTRIC MOTILITY TO HYPOTHYROIDISM

Gastrointestinal symptoms may occasionally be observed in certain patients with hypothyroidism. The discomfort usually consists of abdominal pain for which no organic basis can be demonstrated. The pain is of varying degree and appears to be associated with hyperactivity of portions of the gastrointestinal tract which are innervated by the extended vagus. The gastric motility has been determined in several such patients presenting proved hypothyroidism. The following case is typical:¹³

B. H., a white woman aged 41, was admitted to University Hospital complaining of constipation and frequent attacks of epigastric pain, variable in onset, duration and intensity. Investigation failed to reveal any organic basis for the pain. Laboratory studies revealed low blood iodine determinations and decreased basal metabolic rates, which along with the clinical findings was interpreted as evidence of hypothyroidism.

A motility investigation revealed irregular gastric hyperactivity, type 5, associated with constant epigastric pain plus colic-like epigastric cramps at

TABLE 6.—Analysis of Gastric Motility in a Case of Hypothyroidism (B. H.)

(Complaints: Constipation, Epigastric Pain Basal Metabolic Rate —12. Blood Iodine 27 Micrograms per Hundred Cubic Centimeters)									
Case	Investigation	Type	Length, Min.	Average, Mm.	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Mm.	Maximum Interval, Min.	Comment	
Hypothyroidism 6/20/39	1. Observation	5	24.4	43	26	Maximum of 24	2.8	Dull epigastric pain, with cramps at 4 peaks	
	6/21/39 1. Observation	5	7.3	64	7	Maximum of 37	0.7	Colic like epigastric pain	
	2. Atropine sulfate $\frac{1}{150}$ grain intravenously	Q	7.2	59	12	9 of 25-43	0	Relief of pain	
8/2/39	1 Observation	2	45.0	46	?	Maximum of 13	0	(After Treatment of Hypothyroidism; No Complaints. B. M. R. +1) Normal gastric motility; no clinical sensations	

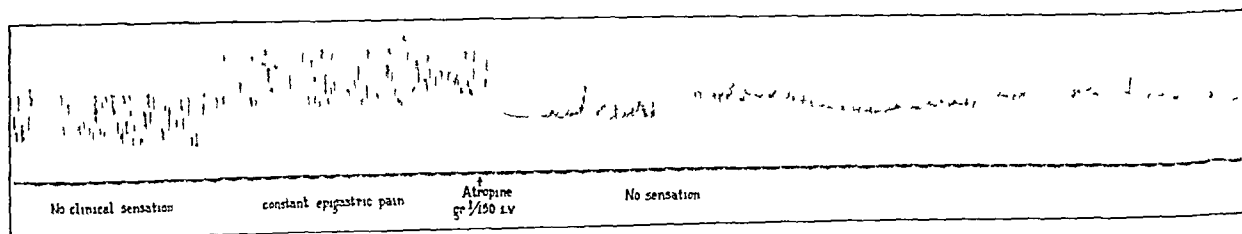


Fig 9 (F. H., April 8, 1939).—Control of the symptom complex of "vagotonia." During the initial hyperactive period the patient experienced no pain. However, following a spontaneous rise in tone, with no change in the gastric hyperactivity, the patient complained of constant epigastric pain. Administration of atropine was followed by a lowered tone, decreased gastric activity and simultaneous cessation of pain.

TABLE 7.—Analysis of Gastric Motility in a Case of Vagotonia (F. H.)

Case	Investigation	Type	Length, Min.	Average, Mm.	Number of Contractions	Number of Contractions of Maximum Amplitude, Range Mm.	Maximum Interval, Min.	Comment	
Vagotonia 4/8/39	1 Observation	8	10.5	34	58	1 of 93	0	No clinical sensations	
		7	14	60	59	4 of 37-63	1.4	Constant epigastric pain	
	2 Atropine sulfate $\frac{1}{150}$ grain intravenously	Q	2	47	..	...	..	Complete relief of pain	
		4	6.5	43	31	1 of 20	0	No sensations	
		3	9	56	41	3 of 12-15	0		
		2	20	50	130	4 of 10-15	0		

tration of adequate amounts of atropine, the patient was able to swallow and retain liquids.

By this means the patient was kept fairly comfortable throughout the duration of his period of hospitalization.

the indicated contractions (table 6, fig. 8). On the following day the kymograph recorded constant irregular hyperactivity associated with colic-like epigastric pain. Following adminis-

¹³ Hamilton, F. E.; MacQuigg, R. E., and Curtis, G. M.: The Gastric Motility in Certain Patients with Thyroid Deficiency, *J. Clin. Endocrinol.* 1:24 (Jan.) 1941.

tration of $\frac{1}{160}$ grain of atropine intravenously there was immediate cessation of gastric hypermotility with simultaneous cessation of the epigastric pain. The patient was then treated for hypothyroidism by the administration of desiccated thyroid and iodine.

Six weeks later, following a satisfactory clinical response to this treatment, investigation revealed a normal basal metabolism plus normal gastric motility. Moreover, the patient had ceased to complain of abdominal pain (table 6, fig. 8).

RELATION OF GASTRIC MOTILITY TO THE SYMPTOM COMPLEX KNOWN AS "VAGOTONIA"

Rather frequently patients are seen who are classed clinically as neurotic. In certain of these persons investigation will reveal that the discomfort of which they complain appears to be limited to the distribution of the extended vagus. In some of these no organic basis can be demonstrated to account for the pain. To this delimited group of patients the term "vagotonia" has been applied.¹⁴ Admittedly the term "vagotonia" is, indeed, inclusive, yet clinically it appears to apply well in this symptom complex. The alterations in gastric motility have been investigated in a number of such patients, as is exemplified in the following case:

F. H., a white housewife aged 46, was admitted to University Hospital complaining of dull, more or less constant epigastric pain. Thorough investigation failed to reveal an organic basis for the pain. There was no evidence of hypothyroidism. At the beginning of a motility study the patient stated that she was quite comfortable and had no pain. However, the kymograph recorded greatly increased gastric activity, type 7. After an interval a spontaneous elevation of tonus was observed, associated with the same type of gastric activity, and at once the patient complained of constant epigastric pain. Administration of atropine was followed by a lowered tonus, decreased gastric activity and simultaneous cessation of pain (table 7, fig. 9). Throughout the investigation the patient did not complain of epigastric discomfort when the stomach was quiescent.

CONCLUSIONS

By the balloon and kymograph method hypermotility of the human stomach has been demonstrated during the clinical appearance of "gas pains," late postoperative nausea, "pylorospasm" due to obstructive duodenal ulcer, biliary colic, the nausea and regurgitation associated with advanced carcinoma of the stomach, certain instances of hypothyroidism and "vagotonia."

In all gastric hypermotility occurred simultaneously with the varying degrees of clinical distress or discomfort. Moreover, the patients ceased to complain of pain or discomfort when the stomach was quiescent. Whether the gastric hypomotility was spontaneous or induced by the administration of atropine made no apparent difference. At the onset of hypomotility the patients ceased to complain of distress.

From these clinical studies it appears that the motility of the human stomach may be regarded as an indicator of certain types of abnormal activity of the gastrointestinal tract. Control of the gastric hypermotility in such instances will often simultaneously control the clinical symptoms associated with the primary condition.

14. Eppinger, Hans, and Hess, Leo: *Vagotonia, Nervous and Mental Disease Monograph 20*, New York, Nervous & Mental Disease Publishing Company, 1917.

The Electron Microscope.—It is believed that in the newly invented electron microscope using electronic waves $1/100,000$ th of the wavelength of visible light, 25,000 to 100,000 magnification with accompanying resolution can be attained.—Gage, Simon H.: *The Microscope*, Ithaca, N. Y., Comstock Publishing Company, Inc., 1941.

CHRONIC ALCOHOLIC GASTRITIS

EVALUATION OF THE CONCEPT, WITH GASTROSCOPIC STUDIES IN ONE HUNDRED CASES

LEONIDAS H. BERRY, M.D.

CHICAGO

Widespread drinking of alcoholic beverages goes back at least to the epicures of antiquity. Laymen and physicians alike have conjured up in their minds a frightful picture of the ravages of alcohol on the lining of the human stomach. Thirty or forty years ago gastritis, and especially alcoholic gastritis, was widely diagnosed on the basis of the character of the secretions removed by the stomach tube. The presence of a large amount of mucus was the essential factor in the diagnosis of "gastric catarrh," or chronic gastritis. In later years gastritis was regarded as a loose term which included many digestive symptoms. Chronic inflammation of the stomach as a definite organic entity was regarded as rare. For a long time it was taught, and in some centers it is still taught, that the one excellent example of chronic gastritis is that due to the chronic use of alcoholic beverages.

Within the last few years, with the aid of the flexible gastroscope, chronic gastritis has been shown to be widespread and to be an important organic entity in persons who do not use alcoholic beverages at all. The statistics of Schindler¹ on a group of 1,000 persons with dyspepsia in America and on a smaller group in Germany showed 41 and 45 per cent, respectively, with chronic gastritis. My recent statistics² based on 800 gastroscopic examinations showed 43.3 per cent of persons with dyspepsia in the gastrointestinal clinic of the Provident Hospital to have chronic gastritis. In none of the groups mentioned was there a significant number of chronic alcoholic addicts. It has become evident to all gastroscopists that certainly persons other than alcoholic addicts may have chronic gastritis. The question therefore arises: What really is the role of alcohol in chronic gastritis, in the light of the more recent advances in this field?

In order to reevaluate the clinical concept chronic alcoholic gastritis, I first reviewed the literature for convincing evidence of experimental alcoholic gastritis in animals and postmortem evidence of the disease in man. Secondly, I undertook to select a fairly large group of persons who unquestionably were alcoholic addicts, to examine them gastroscopically and to correlate certain clinical data with the gastroscopic picture.

EXPERIMENTAL ALCOHOLIC GASTRITIS

Friedenwald³ in 1905 fed 50 per cent alcohol to a large group of rabbits for several weeks and found that he could not consistently produce gastritis. Fahr⁴ in 1911 attempted to produce irritation gastritis in 5 rabbits. He found mild hyperemia, but the gastric tissue was microscopically normal. One of the most

From the Division of Gastroenterology, Provident Hospital.

The chemical studies were made by Clover Oliver, Harriet Thompson and Mary Hamilton.

The chest fluoroscopy was done by Drs. Robert G. Bloch, William B. Tucker and J. E. Bryant.

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 6, 1941.

1. Schindler, Rudolf: Incidence of Various Types of Gastric Disease as Revealed by Gastroscopic Studies, *Am. J. M. Sc.* **197**: 509 (April) 1939.

2. Berry, L. H.: Etiological Relationships of Chronic Gastritis: A Preliminary Report, *Proc. Inst. Med. Chicago* **13**: 14 (May 15) 1941.

3. Friedenwald, Julius: The Pathologic Effects of Alcohol on Rabbits, *J. A. M. A.* **45**: 780 (Sept. 9) 1905.

4. Fahr: Beiträge zur Frage des chronischen Alkoholismus, *Virchows Arch. f. path. Anat.* **205**: 397, 1911.

interesting animal experiments was that of Thomsen,⁵ who in 1925 introduced 50 per cent and 95 per cent alcohol into the Pavlov pouch of a dog at intervals over a period of eight months. He reported that after one month the dog's stomach showed hypersecretion, with

TABLE 1.—*Anamnestic and Laboratory Data on Alcoholic Addicts*

Age: 80% in 3d, 4th or 5th decade
Sex: 97% male, 3% female
Race: 75% white, 24% Negro, 1% Mexican
Habits
Days intoxicated
Average among 40 subjects, 3 to 6 days
Days sober
Average, 4 or 5 days
Years of drinking
1 to 55; 75% of 74 subjects had been drinking 15 years or more
Beverage
Straight whiskey; wine (20% alcohol); beer; denatured alcohol; home brew, miscellaneous alcoholic beverages
Amount consumed daily
40 subjects, average, 2 to 3 pints whiskey; 8 subjects, average, 33 pints of wine
Use of tobacco
33 subjects, average, 21 cigarettes per day; 90% smokers
Symptoms
Delirium tremens
47 of 57 subjects had delirium tremens at some time
Cramps in limbs
33 of 52 subjects affected (very little frank polyneuritis)
Hallucinations
25 of 39 subjects affected
Laboratory data
Wassermann and Kahn reactions
7% positive, 93% negative
Fluoroscopic of chest
7 of 88 subjects, tuberculous lesions
Hemoglobin content (Sahli)
25 of 61 subjects, 75% or less
Blood vitamin C level
49 of 55 subjects, below normal (0.7 mg)
Fractional histamine tests
7 of 56 showed achlorhydria

a great increase in mucus. A biopsy and histologic sections showed acute inflammation. During a two month rest period the mucosa returned to normal, grossly and microscopically. Eight months after the termination of the alcohol feeding the animal became progressively more debilitated and died. Autopsy showed extensive atrophic gastritis. While Thomsen was inclined to interpret the profound atrophy as due to the chronic effect of alcohol, I feel that any chronic debility is likely to be associated with atrophic changes in any organ and that one could not justifiably conclude that the atrophy in the dog's stomach was the direct effect of alcohol.

PATHOLOGISTS' CONCEPTIONS

No pathologic picture has been generally accepted among pathologists as characteristic of alcoholic gastritis. Some investigators have stated that alcoholic gastritis is not infrequently seen at autopsy. Fahr,⁴ for example, stated that gastritis is often associated with so-called alcoholic cirrhosis but that there are many cases of cirrhosis without gastritis. He admitted, however, that the congestion due to obstruction of the portal system rather than the alcohol directly may be responsible for the gastritic changes. Henning⁶ stated that concentrated alcohol solutions damage the glands of the stomach but that weak solutions produce hypersecretion without inflammation. Hirsch⁷ examined at autopsy the stomach in 21 patients who had been heavy drinkers. Nine had died of acute delirium tremens.

5 Thomsen, E. La secretion gastrique dans la gastrite alcoolique d'origine experimentale, *Acta med Scandinav* 61: 540, 1925.
6 Henning, N. Die Entzündung des Magens, Leipzig, Johann Ambrosius Barth, 1934.
7 Hirsch, E. F. The Gastric Mucosa in Delirium Tremens, *Arch Int Med* 17: 354 (March) 1916.

Zenker's fixing fluid was introduced into the stomach immediately after death in every case, and sections from all parts of the stomach were studied microscopically. These sections were compared with the original sections of the anatomist Bensley,⁸ from which he described the normal microscopic picture of the adult stomach. The studies of Hirsch revealed scattered petechial hemorrhages but no consistent gastritis.

GASTROSCOPIC STUDIES

The earliest description of the living human stomach after the ingestion of alcohol was that of Beaumont⁹ in 1833 concerning the fistulous stomach of Alexis St. Martin. The picture was essentially that of erythema and increase in the secretion of mucus. Only one article written since the advent of the flexible tube gastroscope could be found in the foreign literature, and none in the American literature, on the gastroscopic appearance of the stomach in a group of persons with severe chronic alcoholism. A preliminary report² of my alcoholic studies was made before the Chicago Society of Internal Medicine, Feb. 24, 1941. In 1936 Villaret, Moutier and their associates,¹⁰ of Paris, studied 45 chronic alcoholic addicts gastroscopically. Each had polyneuritis and an enlarged and painful liver. Of the 45, 20 had also had ascites. All had digestive symptoms, such as increasing anorexia, bilious vomiting, constipation and diarrhea and distress after meals. Gastroscopically, all but 1 showed chronic atrophic gastritis. Fifteen patients came to autopsy, and the diagnosis of atrophic gastritis was confirmed.

My series consisted of 100 ambulatory alcoholic addicts. None of them had an enlarged or painful liver or ascites. Sixteen came to the clinic because of some type of digestive distress. The remaining 84 subjects did not seek medical aid but were induced to come to the clinic only for this study. (They are termed nonclinic addicts hereafter.) They were unattached men who lived for the most part in "flophouses" and

TABLE 2.—*Distribution of Gastroscopic Abnormalities in One Hundred Chronic Alcoholic Addicts*

	Clinic Alco holic Addicts	Nonclinic Alco holic Addicts	Totals
Superficial gastritis (mild) . . .	1	34	35
Superficial gastritis (moderate)	1	17	18
Superficial gastritis (severe)	1	0	1
Hypertrophic gastritis.	1	1	2
Atrophic gastritis.	2	3	5
Superficial and hypertrophic gastritis	1	3	4
Superficial and atrophic gastritis	4	0	4
Erosions and hemorrhages (without gastritis).	1	3	4
Normal gastric mucosa.	3	23	26
Summary			
Superficial gastritis, all forms	8	54	62
Atrophic gastritis, all forms	7	3	10
Hypertrophic gastritis, all forms.	2	4	6
Erosions and hemorrhages (without gastritis)	1	3	4
Normal gastric mucosa	3	23	26

"cage" hotels in the Loop district of Chicago. In their own language they were "on the bum" (table 1). They were mostly middle aged; 75 per cent were white, 24 per cent Negro and 1 per cent Mexican. Most of them

8. Bensley, R. R., in Buck, A. H. The Reference Handbook of the Medical Sciences, ed. 2, New York, William Wood & Company, 1904, vol. 7, p. 461.

9. Beaumont, William. Gastric Juice and the Physiology of Digestion: A Facsimile of the Original, Cambridge, Mass., Harvard University Press, 1929.

10. Villaret, M.; Moutier, F.; Justine Besançon, L., and Klotz H. P. Caractère spécial des troubles gastriques (ana ou hyperchlorhydrie gastrite atrophique) au cours de la polyneurite alcoolique, *Bull. Soc. M. d. hôp. de Paris* 52: 1155 (July 13) 1936.

drank in bouts of several days, remained sober for a few days and became drunk again. Others drank continuously each day. Most of them had been drinking for fifteen or more years. They consumed such varied beverages as straight whisky, beer, rubbing alcohol, home-brew, automobile antifreeze and bay rum. Whisky drinkers consumed 2 to 3 pints (a pint is 0.47 liter) per day. Some addicts drank a half gallon of wine or as much as a gallon (3.7 liters) of beer. Ninety per cent of the addicts were also heavy smokers. They were tremulous when not drinking, and many of them had delirium tremens. Cramps in the limbs rather than frank polyneuritis occurred as a rule, and hallucinations were present in some cases. The percentage of positive Wassermann reactions was not higher than that for the general population. Seven of 88 addicts had incipient tuberculosis. Nearly one half of the subjects had low grade anemia, and most of them had severe vitamin C and nicotinic acid deficiencies, as measured by the plasma ascorbic acid levels and by the porphyrin bodies in the urine. Fractional histamine tests showed achlorhydria in 7 of 56 cases. Four fifths of the men ate little or no food while drinking.

The gastroscopic picture of the 84 nonclinic alcoholic addicts was at first surprising because of the absence

in the clinic was of the atrophic type.² Further, experiments strongly suggest that vitamin B complex deficiencies constitute one cause of atrophic gastritis.² Perhaps the more or less constant local hyperemia in the stomach of the alcoholic addict supplies adequate nutrition to the mucosal cells and thereby tends to prevent atrophy.

The 16 clinic alcoholic addicts drank at greater intervals and consumed smaller quantities of alcohol than the nonclinic addicts. Some had stopped drinking entirely for considerable periods. These patients, who were also in poor vitamin nutrition, showed a high percentage of atrophic gastritis.

SYMPTOMS

My study reveals that the heavy-drinking, nonclinic alcoholic addicts, who also smoked almost incessantly, usually had no distress after meals. In striking contrast to the clinic patients with chronic gastritis, the alcoholic addicts could tolerate all kinds of meats, baked or fried, and foods such as chile con carne and barbecue. They used large quantities of such condiments as red pepper and horse radish. Their bowels moved once or twice a day, or they had mild diarrhea rather than the constipation seen so frequently in persons with non-



Fig. 1.—Gastroscopic view: mild chronic superficial gastritis (alcoholic type).

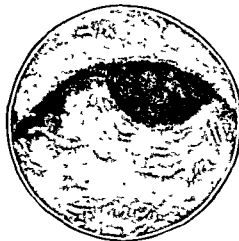


Fig. 2.—Gastroscopic view: normal mucosa.



Fig. 3.—Gastroscopic view: before therapy.

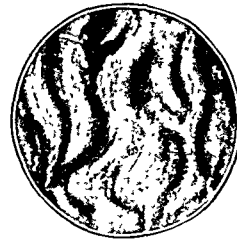


Fig. 4.—View after therapy.

of gross abnormalities comparable to those seen in nonalcoholic gastritis. The one characteristic seen in all cases was a moist and glistening mucosa with increased highlights. The color was usually a uniform, evenly distributed, orange-red, which was described in 35 per cent of cases as indicative of mild hyperemia (figs. 1 and 2). The color was like that in active physiologic hyperemia rather than like the mottled or deeper red seen sometimes in chronic nonalcoholic gastritis. The disease in these cases was classified as mild chronic superficial gastritis (table 2). In 17 per cent of the cases it was classified as moderate chronic superficial gastritis, because in addition to the moist, glistening appearance the mucosa was a moderately deeper orange-red than in the first group. There were also deposits of translucent, gelatinous, gray mucus or porcelain-like white mucus between the folds in some cases. In still other cases there were scattered petechial or ecchymotic hemorrhages and tiny superficial gray erosions. The folds in some cases appeared swollen. In 26 per cent of the series the mucosa was classified as normal, but in the 35 per cent in which the disease was classified as mild superficial gastritis the mucosa presented only a little difference in color. Occasional petechial hemorrhages, erosions or small bits of mucus constituted the principal variations from normal. The low incidence of atrophic gastritis associated with widespread hypovitaminosis and subnutrition was interesting in the light of my experiences with patients with non-alcoholic gastritis. Fifty-seven per cent of all gastritis

alcoholic gastritis. The morning nausea, or tendency to vomit, which some addicts had was prevented by what they referred to as the "eye opener," usually about a half pint of whisky. On the other hand, most of the clinic alcoholic addicts complained of intermittent dull aching around the navel, epigastric fullness, occasional nausea or vomiting. Thus, in order of the severity of their symptoms the group with nonalcoholic gastritis ranked first, the clinic group of alcoholic addicts second and the heavy-drinking, nonclinic alcoholic addicts third.

THERAPEUTIC TESTS

In order to test whether mild inflammatory changes actually occurred, 17 chronic alcoholic addicts were given vitamin B complex and then examined gastroscopically (table 3). These tests are not reported as an experiment in therapy. Properly controlled studies along this line are now being carried out. Observations were made periodically, and the periods of therapy varied from seven days to several months. Fourteen of the 17 subjects were treated in the hospital for two to four weeks, receiving no alcohol. Gastroscopy was done every seven days. Two patients had twelve and thirteen gastroscopic examinations, respectively, over a period of three years, with intermittent courses of therapy with the vitamin B complex. After two or more weeks the gastric mucosa of the hospital-controlled patients showed a slight decrease in the orange-red and a lessening of the moist, glistening appearance (figures 3 and 4 show views of the stomach before and after therapy).

Several patients were kept on therapy a few weeks after hospitalization, during which time further reduction of the mild hyperemia and of the moist, glistening character was evident. The hyperemic color disappeared more rapidly than the moist, glistening character of the mucosa. In a few anemic patients with mild superficial gastritis the mucosa became a pale pink consistent with their reduced hemoglobin level after a few weeks of therapy. In some instances superficial gastritis superimposed on atrophic or on hypertrophic gastritis disappeared, leaving the underlying gastritic changes more prominent. After long periods of therapy atrophic changes tended to disappear also.

TABLE 3.—*Gastroscopic Diagnosis Before and After Vitamin B Complex Therapy for Seventeen Alcoholic Addicts*

Patient	Diagnosis Before Therapy	Diagnosis After Therapy	Follow-Up Period	No. of Gastroscopies
1	Superficial and hypertrophic	Superficial (mild)	1 wk.	2
2	Superficial (mild)	No superficial	1½ wk.	2
3	Superficial (mild)	Superficial (mild)	2 wk.	3
4	Superficial (moderate)	Normal mucosa	2½ wk.	3
5	Superficial (moderate)	Superficial (mild) and hypertrophic	2½ wk.	4
6	Superficial (mild)	Practically normal mucosa	2½ wk.	3
7	Superficial (mild)	Normal mucosa	3 wk.	3
8	Normal mucosa (increased highlights)	Normal mucosa	7 wk.	4
9	Superficial	No superficial; more hypertrophic	7 wk.	5
10	Atrophic	Atrophic (no change)	1 mo.	3
11	Superficial and atrophic (slight)	No superficial or atrophic (but localized hypertrophic)	2½ mo.	4
12	Superficial and atrophic	Normal mucosa	4 mo.	4
13	Atrophic	Atrophic (no change)	4 mo.	4
14	Superficial and atrophic	Atrophic (slight); no superficial	7 mo.	3
15	Superficial and hypertrophic	No superficial; hypertrophic	11 mo.	6
16	Superficial and atrophic (severe)	Mucosa practically normal	3 yr.	12
17	Superficial and atrophic	Gastritis disappeared and reappeared	3 yr.	13

SUMMARY AND CONCLUSIONS

1. The evidence from the literature on attempts to produce chronic alcoholic gastritis in experimental animals shows that in some instances a transient superficial type of gastritis has been produced but that in many other instances no gastritis has been produced.

2. Pathologists have supplied no evidence in the literature of unequivocal chronic gastritis due to alcohol. One well controlled observation (Hirsch⁷) demonstrated frequent gross and microscopic petechial or ecchymotic hemorrhages but no inflammation.

3. No previous gastroscopic study of alcoholic addicts has appeared in the American literature. The one report in the foreign literature, on 45 patients, describes extensive atrophic gastritis, which in my opinion was probably not due to alcohol directly.

4. Gastroscopic studies on 100 persons with unquestionable chronic alcoholism of long standing showed 30 per cent not to have gastritis, 35 per cent to have mild chronic superficial gastritis (with a gastric mucosa only slightly different from normal) and only 35 per cent to have unequivocal chronic gastritis.

412 East Forty-Seventh Street.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. COHN, WHITE AND WEYRAUCH, DRS. HAMILTON AND CURTIS AND DR. BERRY

DR. SIDNEY A. PORTIS, Chicago: It is through such contributions as Dr. Berry's that we are able to reconstruct many of our ideas concerning changes produced in the stomach of patients with chronic alcoholism. All of us have thought in the past that patients with chronic alcoholism usually exhibit chronic gastritis. Many are not acquainted with the type of these patients; if one was to walk along West Madison Street in Chicago one would see the type of derelicts that were used in this experiment. If these individuals, with their debility and inanition, cannot acquire chronic gastritis after the alcohol they take, I doubt whether any one could. It is evident that we must break down some of our older concepts of disease and change some of the nomenclature. We used to talk about alcoholic cirrhosis of the liver and similarly about alcoholic polyneuritis, and yet none of us today believe that alcohol in itself is the cause of either of these two pathologic conditions. Dr. Berry produced such unusual changes in the stomach with the use of vitamin B therapy. He is conducting an excellent clinic in gastroenterology at the Provident Hospital in Chicago.

DR. DAVID J. SANDWEISS, Detroit: Drs. Hamilton and Curtis showed that hypermotility of the human stomach is associated with pylorospasm due to obstructive duodenal ulcer. I should like to ask whether hypermotility is also found associated with the epigastric distress of uncomplicated duodenal ulcer. Patterson and I have found (in a limited number of patients so far studied by the balloon-kymograph method) that epigastric pain due to uncomplicated duodenal ulcer may be present without evidence of gastric hypermotility. We have also found that the Sippy powder solution given to a patient with an uncomplicated duodenal ulcer does not inhibit gastric motility either in frequency or in amplitude of contractions or in the duration of the period of activity. Yet this solution usually gives instantaneous relief of epigastric ulcer pain. It would appear, therefore, that ulcer pains may be present without evidence of hypermotility; also that relief of epigastric distress is not necessarily associated with hypomotility. Apparently, gastric motility is not the only factor involved in epigastric or abdominal pain. How would the authors explain epigastric pain due to ulcer when normal gastric motility is present? In 1916 Ginsburg, Tumpowsky and Hamburger found that "with the onset of strong contractions the patients complained of symptoms varying in interpretation from a feeling of fullness and tightness to severe epigastric pain. The sensation nearly always came on when the contractions had reached their height." Carlson confirmed these findings but added "These contractions are not stronger or more prolonged than the stomach contraction felt as ordinary hunger pangs on days when the subject has no ulcer symptoms." I agree with Drs. Hamilton and Curtis that gastric hypermotility may be associated with certain abdominal or epigastric pains; however, one might question the conclusions drawn from the data presented. Gastric motility is modified by many afferents other than those coming from the gastrointestinal tract, such as somatic pain, physical exercise, emotional states or a cortical lesion. From a practical therapeutic point of view I believe that, while the correlation of gastric hypermotility and the organ primarily involved is of interest, therapy should be directed toward the primary focus rather than toward the hyperactive stomach. Control of the former will invariably relieve the symptoms associated with the latter.

DR. HOWARD T. KARSNER, Cleveland: The report of Drs. Cohn, White and Weyrauch adds information on an additional hazard in the use of preparations containing kaolin. Further observations are required to determine how often this complication occurs. It is possible that the patient suffered at one time from peptic ulcer, which might have permitted entry of the particulate matter into the mucosa and submucosa. It is difficult to understand the presence of the kaolin in the wall of the stomach unless there had been an interruption of surface continuity. The microscopic appearance is characteristic of the so-called pseudotubercle or foreign body tubercle. The giant cells differ from typical Langhans cells of tuberculosis in that although the nuclei are peripherally situated they are not arranged with the long axis radial to the center of the cell.

Care should be exercised not to confuse these and comparable lesions with true tubercles or miliary gummas. The experimental confirmation of the production of similar granulomas in the wall of the rabbit's stomach, together with the microchemical and microcrystallographic studies, leaves no reasonable doubt that the human lesion was due to the medicament. Of interest is the fact that polymorphonuclear leukocytes appear to have played little or no part in the reaction, especially in view of the observations of McCutcheon, Coman and Dixon on negative chemotropic effects of kaolin. As indicated by Dr. Cohn and his co-workers, information about the pathologic effects of deposits of silica is extensive. It is now known that the size or shape of the particles is of little significance in determining the lesion. Furthermore, as shown by King and Belt, the lesion is not proportional in size or character to the amount of silica within it. The lesions in the lung and spleen in silicosis are now believed to be due to silicon dioxide. The peritoneal lesions following the introduction of glove powder are evidently due to magnesium silicate. The authors have shown convincing evidence of the action of hydrated aluminum silicate in the human case and in the rabbit. The lesion differs microscopically from the usual silicotic nodule in the lung, because in the latter there is a far greater disposition to fibrosis and hyalinization than is true of the kaolin lesions. This difference may be due to variations in response to the salts present or may be due to the manner in which the lung and the wall of the stomach react. Important as is this contribution, conclusions cannot yet be drawn as to the effects of the lesion on function of the stomach.

DR. ROBY JOHN F. RENSHAW, Cleveland: I should like to ask Dr. Hamilton how long the effect of intravenous atropine lasted. With the dosage that Drs. Hamilton and Curtis gave intravenously did those patients suffer the same side effects that patients given larger doses subcutaneously or orally might suffer? There was an important point in the paper of Drs. Cohn, White and Weyrauch: the lesion was seen gastroscopically but not radiologically and not even in the gross specimen. The value of gastroscopy in this case cannot be questioned. The remarkable thing is Why don't all the people who take alcohol acquire gastritis? There must be other conditions necessary for the gastritis to develop, even though some irritant constantly insults the gastric mucosa. I shall be interested in Dr. Berry's future reports, hoping that he will observe these patients and others over a longer period of time and correlate not only the effects of alcohol but also environmental and social factors.

DR. HERMAN J. MOERSCH, Rochester, Minn.: Drs. Cohn, White and Weyrauch are to be congratulated on their ability to distinguish gastroscopically such a small lesion as a granuloma. It is especially commendable that they followed up their gastroscopic observations with experimental studies. Their experimental observations again confirm the clinical observations of Beaumont, Rogers and, more recently, Berry that the gastric mucosa under certain conditions, when exposed to an irritant, either chemical or traumatic, may give rise to an inflammatory reaction. This reaction is demonstrated easily by the local application of acetylsalicylic acid to the gastric mucosa. In some cases a region of inflammatory reaction will appear in the gastric mucosa where the acetylsalicylic acid is in contact with it, whereas in other cases such a reaction does not take place. Of even greater significance is the fact that, in those cases in which acetylsalicylic acid gives rise to an inflammatory reaction, such an inflammation is not necessarily associated with clinical symptoms. It is interesting to speculate as to whether persistent irritation of the gastric mucosa will lead eventually to further serious organic disease. This question, of course, is something that cannot be answered satisfactorily at the present time. I am especially interested in the histopathologic data concerning the changes produced in the gastric mucosa by the use of silicates. I cannot agree with the authors that both silica and silicates produce a characteristic microscopic picture in the gastric mucosa. Most observers are in agreement that silica will produce typical changes in tissue. Silicates, however, like any other foreign substance, will produce inflammatory changes but will not, as a rule, produce the characteristic fibrous nodules. It is true that asbestos and probably

sericite may produce changes in tissue closely simulating those produced by silica. Although the distinction between the reaction produced in the gastric mucosa by silica and that produced by silicates may seem only of academic interest, it may be of considerable importance from a prognostic point of view.

DR. WALTER L. PALMER, Chicago: I wish to speak of the paper of Drs. Hamilton and Curtis. I found it difficult to orient myself with regard to the normal contractions. One is in the habit of seeing the so-called types 1, 2 and 3 hunger contractions, with occasional tetanic contractions, followed by periods of quiescence in a normal stomach. I am more accustomed to seeing these contractions measured with a water manometer and perhaps that is the reason it was difficult for me to orient myself. I wondered if they had taken sufficiently into consideration the differences which occur from individual to individual, that is, the normal individual and also the variations which occur with advancing age. Of course, the effect of atropine on gastric motility and on intestinal motility is well recognized. My experience has been the same as theirs in that intravenous injection of atropine does stop the contractions abruptly, but not for a very long time. Dr. Sandweiss has emphasized the fact that the seemingly definite correlation between these gastric contractions and the pain of the patient does not necessarily prove that the pain arose in the stomach. For instance, I have taken contraction tracings from the intestine and from the stomach simultaneously and found that there isn't very much lag in the intestinal contractions as compared with the gastric contractions; therefore it seems to me quite possible that the gas pains of which the patient complained really arose in the intestine rather than in the stomach, and it would seem to me quite likely, as Dr. Sandweiss suggested, that in the case of biliary colic the pain actually arose in the biliary tract rather than in the stomach. With regard to the pain of pylorospasm, Dr. Hamilton, I wish you would tell us how you diagnose that clinically. I doubt if one can.

DR. ALLAN L. COHN, San Francisco: The question as to how this material got into the mucosa, of course, occurred to us at once. We still do not know. We doubt, however, Dr. Karsner, that this man had an additional previous ulcer in this portion of the antrum where we saw the nodule. There was a diffuse infiltration of this material as far as the pylorus. We saw more areas microscopically than we did macroscopically. In the literature on the granulomas caused by talcum powder there is a report by Antopol, who demonstrated that, by rubbing talcum powder on the serosal surface of an appendix, crystals of magnesium silicate can be seen to have deeply penetrated the tissues. It is probable that this material likewise entered the gastric mucosa and caused this tumor by friction, and penetration into these scattered areas. Now, Dr. Moersch, in our paper we made no fine distinction between silica or silicates as the causative agent. We now understand from the manufacturers of the particular agent which the patient had been taking that there is a contamination in the so-called colloidal material of about 2 or 2.5 per cent of crystalline material. It is quite probable that the material consists of both the silicate and silica. The point of the paper, however, remains the same whether the foreign material is silica, silicate or both. In presenting this first case the purpose was to raise the question as to the possible irritative effect not only of kaolin but also of the whole silicate group now used in gastroenterologic practice. Our purpose was also to stress the value of gastroscopy, especially when followed by microscopic studies.

DR. FRANK E. HAMILTON, Columbus, Ohio: Our present purpose is to obtain symptomatic relief from the type of abdominal distress associated with gastric hypermotility. We have repeatedly demonstrated that atropine is the most effective drug for this purpose. There are variations in the normal motility of the human stomach. This has been emphasized by Dr. A. J. Carlson and by Dr. L. E. Barron, who was assisted by Dr. Carlson in developing the method we now use. The lantern slide used to demonstrate normal human gastric motility is from Barron's work. The variations presented by that slide are quite different from the gastric hypermotility demonstrated by the present investigation. None of the patients just presented could be classed as "normal" at the time they were studied. All of them presented a single, proved clinical entity such as

biliary colic or "pylorospasm." In such clinical conditions we have shown that the normal gastric motility is greatly altered and often resembles the Carlson type 2 or even type 3. It is not our contention that the pain necessarily originates in the stomach. Moreover, we have not stated that gastric hypermotility must be demonstrated at the time the patient experiences the sensation of pain. On the contrary we have endeavored to emphasize that when, under certain conditions, a patient complains of this type of abdominal pain we can demonstrate simultaneous gastric hyperactivity. This is particularly true of lesions involving viscera innervated by the extended vagi, as for example cholelithiasis or "pylorospasm" due to obstructive duodenal ulcer. In such instances our clinical diagnosis depends on proving at subsequent laparotomy the existence of a benign, obstructive ulcer of the duodenum. Under such conditions patients occasionally develop preoperatively certain epigastric symptoms to which the general term "pylorospasm" has been applied. At the same time we can usually demonstrate gastric hypermotility. Moreover, if the abnormal gastric hyperactivity associated with this condition can be returned to normal, the patient is simultaneously relieved of the epigastric distress. We have as yet been unable to demonstrate consistent alterations in gastric motility in patients presenting nonobstructive duodenal ulcers. We still maintain our basic conclusions that the motility of the human stomach may be regarded as an indicator of certain types of abnormal activity of the gastrointestinal tract and that control of that hypermotility will usually simultaneously control the associated symptoms.

SULFONAMIDES IN THE TREATMENT OF ERYSIPELAS

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Erysipelas, a common bacterial infection of the skin caused by the hemolytic streptococcus, is a disease entity particularly suitable for the trial of new chemotherapeutic agents. This is true because the location of the lesion makes it available for accurate study and because methods of treatment prior to the use of sulfanilamide were notably unsatisfactory.¹ In 1936, shortly after the introduction of the sulfonamide drugs, Meyer-Heine and Huguennin² reported 150 cases of erysipelas treated with sulfanilamide producing a rapid fall in the temperature and subsidence of the local lesion within forty-eight hours. There were no deaths and few complications. Breen and Taylor³ in 1937 obtained equally gratifying results in 35 cases treated. There were two deaths in this series. Subsequent publications by Snodgrass and Anderson,⁴ Hageman and Blake,⁵ Nelson, Rinzler and Kelsey⁶ and Hoyne, Wolf and Prim⁷ state that the sulfonamide drugs are used with great benefit in the treatment of erysipelas, stopping the progress of the lesion, decreasing the number of days of fever and

the length of hospital stay, reducing the incidence of complications and lowering the mortality rate.

Foley and Yasuna,⁸ in a recent report of 80 cases treated with sulfanilamide with an equal number of untreated control cases, gave comparative results of average duration of fever of two and ninety-four one-hundredths days in treated cases and four and seventy-four one-hundredths days in the controls. The complication rate was 9 per cent in those receiving sulfanilamide and 22.5 per cent in those not getting the drug. Mortality rates were 2.5 per cent in the treated group and 10 per cent in the control series. However, Rantz and Keefer⁹ considered the duration of the disease shortened only if sulfanilamide was given before the third day of the disease. They found no difference in the number of complications or in the number of relapses seen in treated cases and untreated controls.

At the St. Louis Isolation Hospital 165 patients were treated for erysipelas during the two year period between January 1939 and January 1941. All these received sulfanilamide or one of its derivatives in comparable dosage. Each patient in this series was seen by one of us. A somewhat detailed study of this group and the results of therapy is to follow.

Sulfanilamide was the chemotherapeutic agent used in 102 cases, sulfamethylthiazole in 29 cases, and a new acyl derivative of sulfanilamide, S-22, or sulfabenameide,¹⁰ was given in 34 instances. The dosage of these drugs was as follows:

Two-tenths Gm. per kilogram of body weight up to a maximum of 8 Gm. divided into six equal doses and given every four hours for the first twenty-four hours.

Fifteen one-hundredths Gm per kilogram of body weight to a maximum of 6 Gm. in the second twenty-four hours.

One-tenth Gm per kilogram of body weight to a maximum of 4 Gm daily for the duration of the hospital stay.

In addition to chemotherapy, cold boric acid packs were used routinely to relieve pain and discomfort. To prevent recurrence of the lesion, patients were hospitalized from seven to ten days and kept on drug therapy the entire time.

The age and sex distribution with mortality figures for each group are presented in table 1. It will be noted that the majority of these patients were over 40 years of age. It is well understood that erysipelas is especially fatal to the aged and to very young infants. In this series there were only 4 patients under 2½ years of age. Two of these infants, however, 9 months and 3 months of age, had extensive erysipelas that responded promptly to drug therapy.

There were 5 deaths in the group of 165, a mortality figure of 3 per cent. This compares with mortality rates of from 8 to 12 per cent before the use of sulfanilamide as reported by others.¹¹ Necropsies were done in 4 of the fatalities. In each instance there were complicating disease processes. These are listed in table 2.

Blood concentrations of the drug used for these patients varied between 8 and 16 mg. per hundred cubic centimeters. In each instance the local lesion was seen to regress with the treatment outlined. In case 3 the blood culture showed growth of the hemolytic streptococcus on entry but subsequent cultures produced no

1. Toomey, J. A. Prognosis and Treatment of Erysipelas, *Ann Int Med* 12: 166 177 (Aug.) 1938. Hoyne, Wolf and Prim.

2. Meyer-Heine, A., and Huguennin, P. Traitement de l'erysipèle par le chlorhydrate de sulfamido chrysoidine, *Presse med* 44: 454 457 (March 18) 1936.

3. Breen, G. E., and Taylor, I. Erysipelas Treated with Prontosil, *Lancet* 1: 1334 1335 (June 5) 1937.

4. Snodgrass, W. R., and Anderson, T. Sulfanilamide in Treatment of Erysipelas. Controlled Series of 270 Cases, *Brit. M. J.* 2: 1156 1159 (Dec. 11) 1937.

5. Hageman, P. O., and Blake, I. G. Clinical Experience with Sulfanilamide in the Treatment of Beta Hemolytic Streptococcal Infections, *Am J. M. Sc.* 195: 163-175, 1938.

6. Nelson, John; Rinzler, Harvey, and Kelsey, M. P. Sulfanilamide Treatment of Erysipelas, *J. A. M. A.* 112: 1044-1045 (March 18) 1939.

7. Hoyne, A. L.; Wolf, A. A., and Prim, Leona. Fatality Rates in Treatment of 998 Erysipelas Patients, *J. A. M. A.* 113: 2279 2281, 1939.

8. Foley, J. A., and Yasuna, E. R. Sulfanilamide in the Treatment of Erysipelas, *J. A. M. A.* 115: 1330 1333 (Oct. 19) 1940.

9. Rantz, L. A., and Keefer, C. Sulfanilamide in the Treatment of Erysipelas, *New England J. Med.* 221: 809 813, 1939.

10. Sulfabenameide was supplied for clinical trial by Sharp and Doherty. It is a caproamidobenzenesulfonamido derivative and is less soluble in water than sulfanilamide, 0.01 per cent going into aqueous solution. This acyl derivative has been shown to be an effective chemotherapeutic agent with low toxicity in experimental animals.

11. Toomey, J. Nelson, Rinzler and Kelsey. Hoyne, Wolf and Prim. Foley and Yasuna.

growth. Vegetations of bacterial endocarditis were found present in case 4. Blood cultures had been negative. In case 5 death was sudden and due to hemorrhage from a free bleeding acute duodenal ulcer demonstrated post mortem. All other deaths were due

TABLE 1—Age and Sex Distribution with Mortality Figures

Age	Number	Sex	Deaths
Birth to 2½ years . .	4	Male 4 Female 0	0 0
2½ years to 15 years .	10	Male 5 Female 5	0 0
15 years to 40 years . .	25	Male 9 Female 16	0 0
40 years to 60 years .	64	Male 34 Female 30	1 0
60 years to 70 years .	44	Male 25 Female 19	4 0
70 years and over . .	18	Male 11 Female 7	0 0
Total	165		

to the complications of degenerative disease that had not responded to the usual modes of therapy. Four of the deaths occurred in the group of 102 patients who were treated with sulfanilamide, a mortality rate of 3.9 per cent. One death among 29 patients getting sulfamethylthiazole gave a 3.4 per cent mortality for this drug, while no fatalities have developed in the sulfabamide treated series of 34 patients.

Of the 160 patients treated successfully, spread of the lesion was never noted after the first thirty-six hours of treatment. In general the erythema and induration were definitely subsiding after forty-eight hours, although some brawniness was present for from five to seven days.

In 84 cases with initial fever the temperature was normal within twenty-four hours after beginning drug therapy and remained so throughout hospitalization. Fever persisted for forty-eight hours in 49 patients, for seventy-two hours in 12, and in 4 patients for as long as four days. Thus fever persisted longer than forty-eight hours after treatment was begun in only 16 cases, or in 9.7 per cent of cases treated.

TABLE 2—Case Summaries of the Five Fatalities

Case No., Age	Color, Sex	Complicating Diseases	Drug Used	Autopsy
1 62	White ♂	Chronic nephritis, bronchopneumonia	Sulfanilamide	Yes
2 63	White ♂	Aortic aneurysm, degenerative heart disease, cardiac decompensation	Sulfanilamide	Yes
3 54	White ♂	Degenerative heart disease, auricular fibrillation, cardiac decompensation	Sulfamethylthiazole	No
4 63	White ♂	Degenerative heart disease, bacillary glomerulonephritis, right	Sulfanilamide	Yes
5 62	White ♂	Acute duodenal ulcer, massive gastrointestinal hemorrhage, degenerative heart disease	Sulfanilamide	Yes

Only one complication was seen in the entire series, a small subcutaneous abscess beneath the eye requiring incision and drainage. This abscess developed at the site of the erysipelas, in the region of an infected squamous cell carcinoma. There were no recurrences of erysipelas lesions.

Rantz and Keefer,⁹ in their report, stated that complications occurred most frequently in those patients

who did not receive the drug until late in the course of the illness. This has not been our experience. Treatment was begun with the history of the lesion existing from twelve hours to fourteen days before admission in our group of patients. Response of the individual lesion to sulfanilamide was universally prompt regardless of its duration.

As already noted, sulfanilamide was given to 102 of the 165 patients reported in this series. This drug is inexpensive but has the disadvantage of producing toxic symptoms, particularly in older persons. Nausea and methemoglobinemia were frequent. There were occasional occurrences of toxic psychoses with complete disorientation of the patient. Infrequent cutaneous rashes were seen.

Sulfamethylthiazole, although never put on the market and now prohibited from further clinical use, gave excellent results in 29 cases. It was found, in general, to be somewhat less toxic than sulfanilamide. No peripheral neuritis was seen in this small group of patients.

We have no evidence that sulfabamide has wide applicability as a therapeutic agent. In erysipelas, however, it seems to be as valuable as sulfanilamide or sulfamethylthiazole, and in our limited experience it was gratifyingly free from toxic effects. None of

TABLE 3—Duration of Fever After Therapy Was Begun

Number of Patients	Febrile Period After Beginning Chemotherapy	Percentage
84	24 hours	50.9
49	48 hours	29.7
12	72 hours	7.2
4	96 hours	2.4
16	Afebrile throughout	9.7
165		

the 34 patients had any apparent methemoglobinemia, and there were no gastrointestinal disturbances. Two morbilliform cutaneous rashes were seen but disappeared despite continuance of the drug. Mental confusion, so frequently seen in aged persons when given sulfanilamide, was not observed with this new drug.

SUMMARY AND CONCLUSIONS

1. One hundred and sixty-five consecutive erysipelas patients in the St. Louis Isolation Hospital were treated with sulfonamides, with a mortality rate of 3 per cent. Patients over 60 years of age, with chronic heart and kidney disease, furnished 4 of the 5 fatalities among this group.

2. In no instance was the lesion ever seen to spread after the first thirty-six hours on chemotherapy. A small subcutaneous abscess was the only complication. There were no recurrences.

3. In 84 patients an elevated admission temperature had returned to normal after twenty-four hours and remained normal. In 16 cases fever persisted over forty-eight hours but in no instance longer than four days.

4. Sulfanilamide was found to be fairly toxic, particularly for the aged patients in this series. The new drug sulfabamide, used experimentally for 34 patients, produced equally good results, without the usual toxic effects so common to the sulfonamide group of drugs.

5. The prompt response of erysipelas to the sulfonamides makes this the treatment of choice and renders other therapeutic measures obsolete.

INTERSTITIAL EMPHYSEMA IN DIABETES MELLITUS DUE TO COLON BACILLUS INFECTION

REPORT OF FOUR CASES

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The development and spread of gas in the soft tissues is usually considered *prima facie* evidence of anaerobic gas bacillus infection.

It is not generally appreciated that colon bacilli either alone or in association with other aerobic bacteria can, in a patient with diabetes mellitus, produce interstitial gas and the severe constitutional symptoms characterizing gas gangrene.

Chiari¹ in 1893 reported the first case of the formation of gas due to colon bacillus infection in the tissues of a person with diabetes. After the death of his patient he was able to obtain pure cultures of colon bacillus from all organs, the blood and the soft tissues. Inoculation of animals with the organism failed to produce gas. Chiari therefore expressed the belief that the diabetes favorably conditioned the patient for the production of gas in the soft tissues by the colon bacillus.

Hitschmann and Lindenthal² in 1899 reported a similar case in which a clinical diagnosis of gas gangrene had been made. Bacteriologic studies, however, showed the absence of all anaerobes and the presence of the colon bacillus, *Streptococcus pyogenes* and a species of rods that could not be identified. Of these three, the colon bacillus was the only organism that produced gas on culture mediums. Hitschmann and Lindenthal concluded that the colon bacillus produces interstitial gas only in the presence of diabetes. Experimental work by them on depancreatized dogs was unsuccessful.

Warren³ has seen 2 diabetic patients with a clinical diagnosis of gas gangrene. Repeated studies for anaerobic and aerobic bacteria, together with inoculations in guinea pigs, failed to reveal any organisms other than colon bacilli and staphylococci. Warren has observed an additional diabetic patient whose kidney was outlined by gas in a roentgenogram, but apparently the causative organism was not cultured.

Since becoming aware of the possibility of the formation of gas in the soft tissues of diabetic patients with colon bacillus infection, I have seen 4 cases of this condition within two years. It would therefore appear that the condition must be much more common than the dearth of reported cases would indicate and that it is worth while again to call attention to this manifestation of disease.

From the Department of Radiology, State University of Iowa Hospitals.

Case 1 has been reported in detail and the report is to be published in the *American Journal of Roentgenology and Radium Therapy* under the title *Spontaneous Renal and Perirenal Emphysema: Report of a Case in a Diabetic from Escherichia Coli Infection*, by Carl L. Gillies, M.D., and Rubin Flocks, M.D.

1. Chiari, H.: *Zur Bacteriologie des septischen Emphysema*, Prag. med. Wehnschr. 18: 1-4, 1893.

2. Hitschmann, F., and Lindenthal, O.: *Ueber die Gangrène foudroyante*, Sitzungsber. d. Akad. d. Wissensch. Math.-naturw. Cl. 108: 107-108 and 145-163, 1899.

3. Warren, S.: *The Pathology of Diabetes Mellitus*, ed. 2, Philadelphia, Lea & Febiger, 1938, p. 160.

REPORT OF CASES

CASE 1.—E. E., a woman aged 52, entered the hospital on May 20, 1939 because of obstruction of the lower part of the urinary tract.

The patient was known to have had diabetes for the past nine years. On admission the level of blood sugar was 433 mg. per hundred cubic centimeters. The diabetes was difficult to control, and in spite of the administration of 50, 30, 35 and 25 units of insulin daily the patient passed from 26 to 80 Gm. of dextrose in the urine when receiving a diet containing 250 Gm. of potential dextrose.

An indwelling catheter was left in the bladder to relieve the symptoms of obstruction while an attempt was made to get the diabetes under control. On May 25 a severe infection of the urinary tract developed. Cultures showed only the colon bacillus.

The patient continued on a downhill course. A roentgenogram of the urinary tract taken June 20 plainly showed a small amount of gas within the parenchyma of both kidneys. On June 21 another roentgenogram (fig. 1) showed extensive infiltration of gas within both kidneys and in the soft tissues around the kidneys and the adrenal glands.

In the evening of the same day the patient was taken to the operating room and the right kidney exposed. There were a great many blebs present, and bubbles of gas escaped as



Fig. 1.—Both kidneys and adrenal glands are outlined by gas which developed within the soft tissue.

the fatty capsule and the true capsule of the kidney were opened. No odor of gas could be detected. The patient went into shock and died shortly afterward.

Cultures of material obtained from the right perirenal tissues at the time of operation and cultures of blood taken shortly before death showed only the colon bacillus.

CASE 2.—A. S., a man aged 63, entered the hospital on April 19, 1940 with symptoms of obstruction from a carcinoma of the rectum. On April 22 a double-barreled colostomy was done. The patient had moderate diabetes, with a blood sugar level of 420 mg. per hundred cubic centimeters on admission. Because of the operation no food was given by mouth, but 300 Gm. of dextrose without insulin was given intravenously daily. The urinary excretion of dextrose during this period varied from 6 to 53 Gm. every twenty-four hours.

The postoperative course was uneventful until the seventh day, on which signs of a severe infection developed, with a temperature of 104 F. and rapid pulse and respiration. Crepitus was observed in both thighs, and a clinical diagnosis of probable gas bacillus infection was made. A roentgenogram of the right thigh made about four hours before death showed extensive interstitial gas (fig. 2).

At postmortem examination an adenocarcinoma of the rectum that had invaded through the rectal wall was observed. Metastases were present in the liver. There was acute cellulitis

of both thighs, with crepitation extending up over the buttocks. Postmortem cultures of the blood showed colon bacilli and alpha hemolytic streptococci. Cultures of material from the peritoneal cavity in the region of the pelvis showed colon

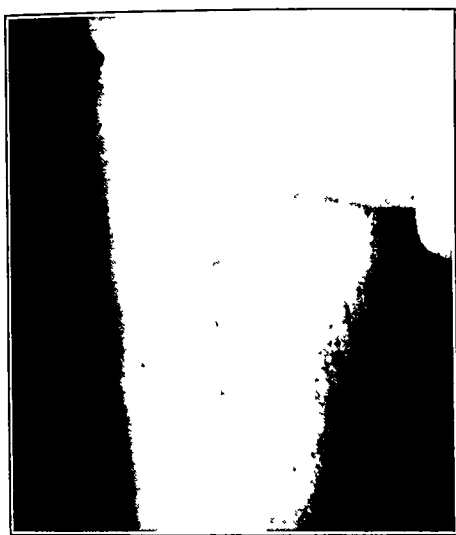


Fig. 2.—Gas is observed within the interstitial tissues of the medial surface of the thigh and on the outer surface below the greater trochanter.

bacilli. Cultures of material from the soft tissues of the right thigh were negative for gas bacilli of the *Clostridium* group but gave pure cultures of colon bacilli.

CASE 3.—D. McV., a man aged 62, was admitted on June 17, 1940. He appeared seriously ill. The left foot showed a gangrenous ulcer on both the plantar and the dorsal surface extending more than halfway to the ankle. There was swelling of the ankle, with definite crepitation anteriorly. Roentgenograms confirmed the presence of gas within the soft tissues (fig. 3).

A diagnosis of diabetic gangrene with severe infection and formation of gas was made. A supracondylar amputation at the thigh was done immediately.

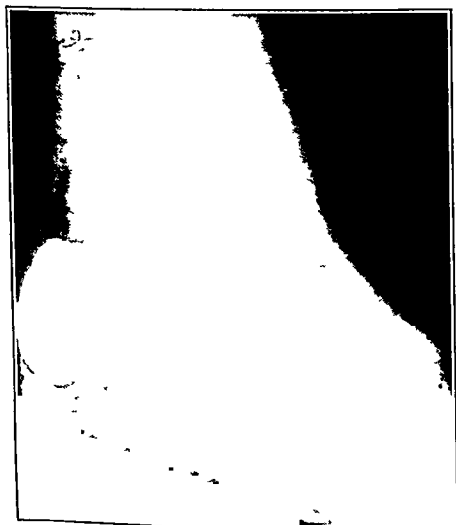


Fig. 3.—Bubbles of gas are present in the soft tissues of the plantar aspect of the foot and anterior to the ankle joint.

Cultures made from necrotic muscle of the amputated leg and foot revealed *Staphylococcus aureus* and the colon bacillus. Cultures for anaerobic bacteria were negative.

The patient's diabetes was not studied until after operation. When the urine was first seen there were large amounts of

acetone and dextrose present. The diabetes was moderately severe, requiring for control 50 units of insulin with a diet containing 170 Gm. of potential dextrose.

The postoperative course was satisfactory, and the patient was discharged on July 14.

CASE 4.—G. W., a man aged 50, entered the hospital on Jan. 6, 1941 because of an infection of the right thigh. This had developed at the site of an injection of insulin three days before.

The patient was acutely ill. The upper part of the thigh was indurated and showed crepitus. The inguinal lymph glands were enlarged and tender. Roentgenograms showed bubbles of gas within a band of soft tissue 2.5 by 25 cm. lying below and parallel to the inguinal region (fig. 4).

The infected area was widely incised on January 6. A foul exudate and necrotic tissue were present. The odor of a colon bacillus infection was noted. Further incision was done on January 15, at which time the skin flaps were sutured back. The patient made a slow but satisfactory recovery.

Cultures of tissue obtained on January 6 showed alpha hemolytic streptococci and were negative for Welch bacilli.

Cultures of exudate taken on January 12 showed hemolytic staphylococci (*Staph. aureus*) and alpha hemolytic streptococci and were negative for Welch bacilli.

Because the organisms found did not explain either the presence of gas in the soft tissues or the odor of colon bacillus infection, further material for culture was obtained on Janu-

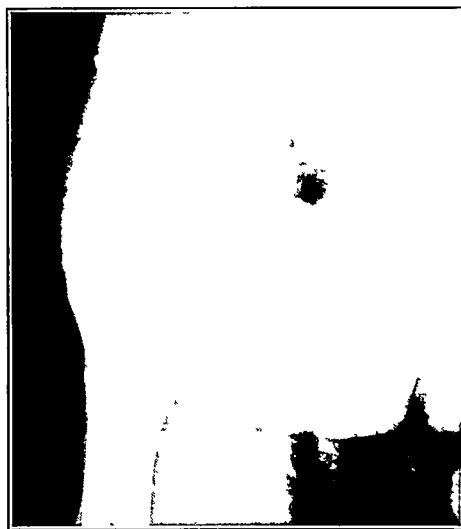


Fig. 4.—A narrow band of gas bubbles extends from the groin upward and outward to a point above the greater trochanter of the femur.

ary 21 and mediums favoring the growth of colon bacilli were used. At this time colon bacilli, hemolytic staphylococci (*Staph. aureus*) and anaerobic beta hemolytic streptococci were found.

This patient had known of his diabetes for eight years and before entrance had been requiring 36 units of protamine zinc insulin daily with a diet containing about 215 Gm. of potential dextrose.

When first seen in this hospital and at the height of the infection he received 36 units of protamine zinc insulin plus 45 units of regular insulin daily. On a diet of 390 Gm. of potential dextrose he excreted 42 to 52 Gm. of dextrose.

The diabetes has improved along with the infection. It is now controlled by 35 units of protamine zinc insulin plus 10 units of regular insulin daily, with the patient on a diet containing 290 Gm. of potential dextrose.

COMMENT

The ability of the colon bacillus to produce gas from culture mediums containing carbohydrates is well known. While this organism alone can probably on

occasion produce interstitial gas in a nondiabetic patient, it seems logical to assume that the presence of an increased dextrose content of body fluids and tissues offers a situation more favorable for the production of gas.

In support of this belief are the reported cases of the formation of gas in the urinary tract of diabetic patients with colon bacillus infection. It appears to be well established that at least one of the causes of primary pneumaturia is the decomposition of sugar-containing urine in the bladder by the colon bacillus.⁴

Olsson⁵ reported a case in which gas was roentgenographically demonstrated in the renal pelvis of a diabetic woman who had pyelonephritis caused by the colon bacillus.

Sanes and Doroshow⁶ reported 2 cases of cystitis emphysematosa with colon bacillus infection. One patient was a diabetic woman and the other an infant aged 3 months who had been receiving dextrose intravenously. These writers also noted association of an elevated sugar content of the blood with colon bacillus infection.

Marquardt⁷ has recently reported another case of cystitis emphysematosa, in a diabetic woman aged 56 from whose urine were cultured the colon bacillus and *Streptococcus lactis*.

A most unusual case of formation of gas was reported by Reis.⁸ Gas bubbles were observed in the anterior chamber of the eye of a diabetic woman with ophthalmitis thought to be due to the colon bacillus.

In diabetic gangrene not only is there an increased amount of sugar in the tissues but the impaired circulation delays absorption of any gas that may form.

In cooperation with Dr. James Greene two attempts were made to produce interstitial gas experimentally by injecting strains of the colon bacillus in the leg of a depancreatized dog whose diabetes was only partially controlled by insulin. We were unable to detect gas either clinically or roentgenographically, and the dog recovered completely from both infections. Because of the known resistance of dogs to colon bacillus infection, we do not consider the experiment comparable to similar conditions in man.

The histories of patients with true gas gangrene treated in this hospital have recently been reviewed by Bartels.⁹ During the past ten years there have been 45 patients for whom the diagnosis of gas gangrene has been confirmed by the bacteriologic identification of anaerobic gas-producing bacteria. Of this group 9 were known to have diabetes. All had diabetic gangrene, but in only 1 was gas detected before amputation. In 8 the signs and symptoms of gas gangrene developed in the stump after amputation for diabetic gangrene.

CONCLUSION

With any diabetic patient showing signs of infection and the presence of interstitial gas, the possibility of colon bacillus infection should be considered first in the differential diagnosis from true gas gangrene produced by anaerobic organisms.

HALITOSIS

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Interest in halitosis, or abnormally foul breath, has to a large extent been preempted by the oral surgeon and the rhinologist; from the references in the general literature one would surmise that it is a rare disease instead of a common condition, so little interest in the subject having been shown in the past. Every writer on the topic has emphasized the mouth, the teeth and the pharynx as sources of bad odors on the breath, attributing the fetor to decaying teeth, pyorrheal abscesses and necrotic pathologic processes in the pharynx, such as breaking-down tumors and gummas. Obviously, with the present national campaign of education and the much improved care of the teeth and the gums in children and in adults, the mouth has receded in importance as a source of bad breath; such conditions as necrotic growths are unusual and of academic interest only and play a small part. The teeth, the gums and the pharynx account for true fetor ex ore but do not explain the internal malady known familiarly as halitosis.

Our attention was attracted to this subject by the controversy which arose between two sets of observers who reported the effects of the oral administration of garlic on the exhalations of normal persons and of patients. In 1935 Haggard and Greenberg¹ reported on the feeding of raw garlic and stated that the odor of garlic on the breath resulted only from particles of the substance retained in the crevices of the teeth. When the garlic was ingested by capsule, no odor on the breath resulted. They claimed to have been able to eliminate the odor from the mouth by the use of chlorinated washes and preparations. A year or so later, Blankenhorn and Richards² contradicted the claims of Haggard and Greenberg. By inserting garlic via a gastrostomy tube into the stomach of a patient with complete stenosis of the esophagus, they were able to recover the odor of the garlic on the breath. With another patient, on whom tracheotomy had been performed for laryngeal carcinoma, the odor of garlic was recovered in the exhalations from the tracheotomy tube. Obviously, garlic had been absorbed by the gastrointestinal tract and its odor emitted via the lungs and the breath, even though all connection between the stomach and the mouth had been surgically eliminated.

Opposing views as to the source of a garlic odor on the breath were thus represented: (1) that the mouth and teeth are the offenders and (2) that the breath is the excretory channel of absorbable malodorous materials.

OBSERVATIONS ON PATIENT W.

An unusual combination of clinical conditions in a single patient presented an opportunity for the study of odors on the breath. This patient (W.), seriously ill with ulcerative colitis, had undergone colostomy for obstruction low in the intestine (in the middle part of the transverse colon) and ileostomy as a life-saving

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5. Olsson, O.: *Spontanes Gaspneumogramm*, *Acta radiol.* **20**: 578-584, 1939.

6. Sanes, S., and Doroshow, G.: *Cystitis Emphysematosa*, *J. Urol.* **32**: 278-286, 1934.

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8. Reis, W.: *Gasblaschen in der Vorderkammer ein neues differentialdiagnostisches Kennzeichen der metastatischen Coliendophthalmie bei Diabetes*, *Klin. Monatsbl. f. Augenheilk.* **83**: 784-787, 1929.

9. Bartels, R. N.: Personal communication to the author.

From the Medical Services of the Mount Sinai Hospital. This study was assisted by a grant from the Bristol Myers Company, of New York.

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Second Annual Session of the American Medical Association, Cleveland, June 4, 1941.

1. Haggard, H. W., and Greenberg, L. A.: *Breath Odors from Alkaline Substances*, *Cause and Remedy*, *J. A. M. A.* **101**: 2167 (June 15) 1935.

2. Blankenhorn, M. H., and Richards, C. E.: *Garlic and Breath Odor*, *J. A. M. A.* **107**: 409 (Aug. 8) 1936.

measure. In the latter operation the terminal portion of the ileum had been transected and both stomas anchored in the abdominal wound. In addition, the patient having a toxic psychosis, an indwelling gastric Levin tube had been inserted and was maintained in place for feeding.

The first observation of interest relates to the persistence of a strong odor of paraldehyde on the breath of the patient forty-eight hours after the administration of the drug by gastric catheter. The discharge from the site of the ileostomy was free of odor, the colon was surgically isolated and yet the odor on the breath was strong. It was a simple matter to wash out the stomach and prove that no trace of the drug remained in the gastric secretions; nevertheless for two days the odor of paraldehyde emanating from the mouth permeated the room.

The patient provided an ideal combination of conditions for the observation of other odors, particularly that of garlic, on the breath, since one could study mouth, stomach, ileum and colon as almost independent and isolated units.

The following set of simple experiments afforded a factual basis for thought and for application when directed toward the clinical explanation of true halitosis.

EXPERIMENT 1.—On April 17, 1940 at 4 p. m. the patient was given through a gastric catheter 1 cc. of concentrated extract of raw garlic (a water-alcohol trituration). There was no odor on the breath until 7:20 p. m., when the odor of garlic first became evident on the exhaled breath and in the ileostomy drainage. Evidently the odor was not present on the breath when the garlic extract was in the stomach alone but made its appearance only after the extract had reached the small intestine.

This experiment was repeated, and it could easily be demonstrated by gastric aspirations that, though the gastric content was redolent of garlic for two hours after its insertion through the tube, no odor could be detected in the mouth until the vegetable matter had reached the small intestine and presumably been absorbed.

EXPERIMENT 2.—On October 8 the patient had 3 cc. of garlic extract injected into the stomach through a Levin tube at 4:40 p. m. At 6 p. m. there was no odor on the breath but the gastric aspirate was definitely odorous of garlic. At 6:40 and 7:30 p. m. the breath was strong in garlic odor, as was the ileostomy drainage.

On October 9 at 8 a. m. the odor had persisted on the breath and in the ileostomy drainage after sixteen hours; the gastric aspirate had no odor after sixteen hours. At 6 p. m. the odor on the breath was still fairly strong, but there had been none in the ileostomy drainage or in the stool since 8 a. m. after twenty-six hours.

On October 10 at 9 a. m. the odor of garlic was still present on the breath (after forty hours); it persisted until 2:30 p. m. (forty-five and one-half hours altogether). At 5 p. m. (after forty-eight hours) there was no odor on the breath.

The garlic odor on the breath was not present in the first hours, even though garlic could be demonstrated by aspiration to be residual in the stomach, but was present long after the gastric aspirate was free of garlic. The odor persisted in the mouth more than twenty-four hours after the stomach, ileum and colon were shown to be free of a persistent residue of garlic.

EXPERIMENT 3.—On October 11 the patient had 5 cc. of garlic extract injected into the distal loop of the ileum at 9:45 a. m. By 10:45 a. m. a faint odor had appeared on the breath; it was still present though faint at 5 p. m.

Apparently absorption from the distal part of the ileum and the colon does take place, and the substance is excretable on the breath. (The constant diarrheal

movements of the patient probably interfered with full absorption.) The stomach, the upper part of the ileum and the jejunum play absolutely no part.

When experiment 3 was repeated, with the garlic inserted into the proximal loop of the ileum, prompt absorption was demonstrated by the appearance of the odor on the breath within three hours.

EXPERIMENT 4.—In order to ascertain the role of the teeth and the mouth as isolated organs in maintaining a characteristic odor, the anterior and posterior surfaces of the patient's teeth and the interstices were painted with a strong garlic extract by means of a camel's hair brush, no saliva being swallowed. For one hour only there was a strong garlic odor on the breath; soon thereafter no odor was detectable.

To check up on the foregoing surprising observation, a normal person was asked to chew some strongly garlickized salami, swallowing none of it and expelling all his saliva. Large particles of salami were driven into the interdental spaces. The immediate odor on the breath was powerful, but within an hour only a faint odor remained, and within two hours no odor of garlic was detectable.

EXPERIMENT 5.—Whisky, instead of garlic, was employed in order to evaluate the role of the mouth alone in halitosis. Normal persons were asked to rinse the mouth and teeth with strong rye whisky, swallowing being suspended during the operation. The whisky odor was retained on the breath only twenty to thirty minutes.

A normal person introduced into the fasting stomach a Levin tube, then rinsed the mouth and teeth with good rye whisky and swallowed an abundant amount. Immediately the ingested whisky was siphoned out of the stomach and the gastric chamber washed with warm water. Within twenty minutes even the slightest whisky odor had disappeared from the breath.

These experiments were repeated on the psychotic patient W. When whisky was injected through the Levin tube, care being taken to avoid all contamination of the mouth, no odor was immediately apparent on the breath, though by repeated aspirations of the gastric contents the whisky was shown definitely to have been retained in the stomach. At no time did a whisky breath become evident; presumably the quantity necessary to produce an alcoholic breath far exceeds the therapeutic dose, and apparently the whisky must first be absorbed.

GROUP OBSERVATIONS

A more extensive study of garlic and other odorous substances was undertaken with large numbers of hospital patients in order to trace the path of absorption, excretion and exhalation of such substances. Patients with a jejunostomy, ileostomy or colostomy opening, a short-circuiting anastomosis, a gastrojejunocolic fistula or pyloric stenosis were utilized, as well as many subjects who had undergone resection of a segment of the small intestine or partial or complete colectomy.

Raw chopped garlic was enclosed in double gelatin capsules for oral administration, and the same capsules were used for insertion into various bodily apertures, natural and artificial. The dose of garlic ranged from 0.5 to 1 Gm.; however it was administered, a latent period of one-half to one or two hours ensued, during which no odor on the breath was demonstrable; thereafter a strong odor occurred, which lasted for four to twenty-six hours and then tapered off to a musty faintness. Children were found most susceptible to small doses; women were much more susceptible than men. The garlic was absorbed from all parts of the intestinal tract, large or small, regardless of the extent of the resection which had been performed. No garlic seemed to be absorbed from the stomach in cases of complete pyloric stenosis. If belching or vomiting took place

while the stomach contained garlic, the odor was immediately apparent on the breath. As long as the cardia acted as an effectual valve, no odor could be observed.

Once the garlic was in the intestine, cathartics and enemas were ineffectual in ridding the intestine and the breath of garlic odor. One or two doses of a saline cathartic were eventually effectual if the amount administered was sufficient and the effect obtained soon enough after ingestion.

When garlic and indigo carmine were inserted into a jejunostomy opening, the odor appeared on the breath in one-half hour and persisted for nineteen hours; during that whole period the indwelling gastric catheter proved that none of the material had been regurgitated into the stomach. Evidently the mechanism of reverse peristalsis plays little part in the production of garlic halitosis, a fact which has much negative significance in the interpretation of the meaning of true halitosis.

ROLE OF THE LIVER AND BILE IN THE TRANSMISSION OF GARLIC ODORS

It was at this point apparent that garlic halitosis depended on absorption of the material from the intestine and was independent of an oral or a gastric mechanism. But it was also noted, by observations made on patients with various intestinal stomas, that long after the garlic odor had disappeared from ileac or colonic washings and drainage fluids the oral odor persisted. One of our earliest observations was that the ileostomy drainage ceased to smell of garlic after seven hours but that the breath gave off the odor for fully forty hours longer.

Where in the body was the garlic being stored? Naturally our first thought was the liver, one of whose functions is the storage and detoxification of foreign materials. We were able to utilize in our experiments 3 patients with carcinoma of the pancreas and complete obstruction of the bile passages in whom biliary drainage had been surgically established. When 0.5 Gm. of garlic (in a capsule) was administered by mouth the typical garlic odor was detectable in the bile within one or more hours. The same held true when the garlic was administered by rectum. The odor in the bile persisted for fifteen hours; on the breath it lasted twenty-five. In another experiment a saline cathartic was given six hours after the ingestion of garlic; the laxative failed to have effect, since the odor persisted in the bile for twenty-two hours and on the breath for twenty-four. Odor in the bile and odor on the breath appeared almost simultaneously, but that on the breath always persisted for one to two hours after the bile had ceased to be malodorous. Once the bile drainage became redolent of garlic, it was not possible to drive out the odor by the use of saline laxatives or to shorten its expected duration. We should like to have tried the effects of mild mercurous chloride or cholagogues on the duration of the garlic odor in the bile, since it seems logical that a true cholagogue would materially curtail the duration of such an odor. There has not been sufficient opportunity or time for all the experiments which suggest themselves. However, this much is true: After the liver cleaned itself of the garlic odor, the breath followed suit within a few (usually only two) hours.

OBSERVATIONS WITH VOLATILE SUBSTANCES

Many of the experiments in which garlic had been employed were repeated with oil of peppermint and oil of wintergreen in order to ascertain some simple facts. We wished to know whether other volatile odorous substances travel the same route from intestine to liver

to lungs and to breath and whether such pleasant odorous matters are exhaled on the breath. In general, the volatile oils of peppermint and wintergreen acted exactly as had garlic. Children and women excrete peppermint on the breath when it is given in moderate doses; men excrete it with less facility and only when it is given in much larger amounts. Oil of wintergreen is much less potent than peppermint, large doses being necessary to produce the odor on the breath. When peppermint and garlic were given simultaneously it was not possible completely to mask the garlic odor even by large doses of peppermint oil. The odor of peppermint could be recovered from the bile drainage of patients with cholecystectomy openings when the oil had been administered either orally or rectally. With the oral dose, the odor on the breath lasted one to six hours; with the rectal dose, the odor persisted in the bile only one to two hours.

During these experiments we observed a patient suffering with diffuse eczema of the trunk and the extremities, to which liberal applications of a mentholated ointment had been applied to allay the pruritus. The breath of this patient smelled strongly of menthol. This fact should not seem unusual, since it has been known that oil of garlic applied to the soles of the feet of a child can give rise to garlic breath.³ We were easily able to reproduce this simple phenomenon of cutaneous absorption and exhalation on the breath with pure oil of garlic applied to the skin of a child.

Skatole and indole were investigated because they had long been considered important intestinal factors underlying true halitosis. Indole, in doses of 25 to 250 mg., was administered by mouth (in capsule form) to patients of various ages and of both sexes. With the larger doses, several persons had toxic symptoms of nausea and lassitude; the odor of indole usually appeared on the breath one hour after ingestion, and it endured for one to thirteen hours. It could be easily overcome by administering oil of peppermint.

The ingestion of skatole in capsule form creates a peculiar musty odor not unlike that of true halitosis but weaker and of shorter duration than the odor caused by indole or the other volatile substances used in experiments.

COMMENT AND CLINICAL APPLICATION

What relation do the interesting pharmacologic observations mentioned bear to the elucidation of the problem of true halitosis?

Unless pathologic oral or nasopharyngeal conditions exist, the mouth, the teeth and the pharynx play little or no part in the production of essential halitosis. Nor, for that matter, does the stomach play a part, for it can easily be shown that with a perfectly functioning cardiac sphincter, malodorous substances introduced into the stomach do not, by their mere presence, taint the breath. One can verify this point by smelling the breath of patients with pyloric stenosis, whose gastric content is always rancid and malodorous. Providing neither vomiting nor belching has recently occurred, the breath of such patients is not redolent of the characteristic vile-smelling gastric residue.

A patient with gastrojejuno-colic fistula was observed; the fistulous tract was large and broad and had established itself between the transverse colon and the stomach. When the patient belched, a vile fecal odor was apparent on the breath; otherwise halitosis was absent.

3. Silverstine, C. T.: Garlic Breath Odor, *Ohio State M. J.* 32: 1232 (Dec.) 1936. Peechey, John: *The Compleat Herbal of Plants*, ed. 2, London, 1707.

Obviously the intestines, large and small, are the critical points, for the mucosa allows the absorption of noxious materials, their transport to the liver and their further migration, apparently by way of the circulation, to the lungs and thence to the breath. That this is the route traversed by garlic can be easily demonstrated. We have traced the garlic as far as the liver and the biliary excreta. That garlic is and can be carried in the blood stream has been shown by Goodman and Bearg,⁴ who demonstrated on the breath of newborn infants the odor of garlic which had been ingested by the mother before delivery. Since the only method of transference would be for substances to pass from the maternal circulation through the placenta to the fetal circulation, it must be assumed that the blood can carry garlic in solution. The lungs function as an organ of excretion, withdrawing volatile materials from the circulating medium and exhaling them on the breath. Similarly, when paraldehyde is injected intravenously the odor appears rapidly on the breath and persists for forty-eight hours.

Let the hypothesis be made that essential halitosis is the excretion on the breath of malodorous fats, fatty acids or volatile substances resultant from some fault in the digestion or metabolism of fat. The noxious volatile matter is absorbed from the intestinal tract (probably from the lower part of the ileum), is carried to the liver (where insufficient or ineffectual neutralization or detoxification ensues), is partly excreted in the bile but in the main is picked up by the circulating blood, which in traversing the alveoli of the lungs parts with the substance, which is exhaled on the breath. What clinical facts can be brought forward to substantiate such a hypothesis? It has been noted that the Chinese strenuously object to the body odor of white persons and attribute that odor to the milk and butter which Caucasians so freely ingest (Snapper).⁵ Caucasians are said by the Chinese to smell of "cow." We have observed that patients with ulcer given a Sipsey diet or, particularly, treated by the continuous milk drip method frequently have true halitosis. If such patients are given a diet of cereal, eggs and lean meat—a diet of low fat content—the typical odor disappears. If a high fat diet containing butter and milk is reinstated, the halitotic odor will readily recur.

Patients suffering from true halitosis are similarly amenable to the therapeutic test of a low fat diet. If a reducing diet, low in fats (40 to 60 Gm. a day), is administered, a prompt disappearance of the halitotic odor occurs.

Our clinical observations are as yet too few and too recent to allow us to make our hypothesis a categorical statement, but the therapeutic suggestiveness of the procedure seems promising.

A direct attack on the intestine and the liver should also merit attention, for these are the sources of the disagreeable odor. A single moderate dose of a saline laxative does not clear up halitosis. If the laxative is given daily in larger doses, the oral odor is much ameliorated.

Colonic irrigations are less effectual in reducing the oral fetor, a fact which makes us believe that the small rather than the large intestine is the sink of iniquity. Constipation in itself seems to play little part in the production of halitosis.

What part the liver plays remains at this point conjectural. We were unable to drive out the odor of garlic

from the bile by the use of saline laxatives or cathartics, but, again, insufficient time and experiments preclude final deductions. Perhaps a true choleric would serve such a useful purpose successfully.

It would be alluring to think of covering a true halitotic odor by the administration of oil of peppermint or oil of wintergreen. If the oil were ingested in sufficient amount, the exhaled odor might within two to three hours overcloud the halitotic odor and replace it with a less noxious if not an agreeable one.

Mouth washes containing pleasantly odorous materials serve to hide or mask true halitosis as a temporary measure but fail completely to meet the problem, since the source of the fetor is in the intestine and the metabolism. A true attack on the problem must be directed to the fatty or volatile constituents of the diet and their elimination via the liver, the intestinal tract and the lungs.

This report is intended as a preliminary rather than as a finished study. The amplification of our hypothesis and its tentative implications in the study of large numbers of patients with true, or essential, halitosis would require considerable time, patience and accurate observation. Methods of precision and titrimetric estimations of odors have in our hands proved less satisfactory than the direct use of the nose. The clinical application of our hypothesis to the study and elimination of essential halitosis should readily prove the theory of the intestinal origin of halitosis and the hepatic storage of halitotic agents, or the theory should be corrected and revised by additional facts and observations.

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THE ORAL MANIFESTATIONS OF VITAMIN DEFICIENCIES

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AND

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As the main system for the ingestion and absorption of foodstuffs, the gastrointestinal tract occupies a prominent position in the causation of vitamin deficiencies. Thus it has been pointed out that "any pathologic condition which interferes with normal food intake, normal digestion, normal absorption of the products of digestion, and normal utilization of these products by the liver, may produce secondary or conditioned avitaminosis."¹ In addition, the gastrointestinal tract is one of the first systems to present objective clinical signs when deficiencies of certain vitamins occur.

An examination of the diets usually prescribed for patients with peptic ulcer, colitis and disease of the gallbladder shows that they often consist mainly of refined carbohydrate and are apt to be deficient in one or more of the vitamins. Patients with idiosyncrasies regarding food expressed in the diet they select will more often than not favor refined foods low in vitamins. On the

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Studies on which this paper is based were aided by grants from the John and Mary R. Markle Foundation, the Dazian Foundation for Medical Research, the Williams-Waterman Fund of the Research Corporation and the Nutritional Research Fund of the Medical Service of the Psychiatric Division of Bellevue Hospital.

1. Mackie, T. T.; Eddy, W. H., and Mills, M. A.: Vitamin Deficiencies in Gastrointestinal Disease, *Ann. Int. Med.* 14:28 (July) 1940.

4. Goodman, Louis, and Bearg, Phillip: That Garlic Odor, *J. A. M. A.* 108:136 (Jan. 9) 1937.

5. Snapper, I.: Personal communication to the authors.

other hand, even when the prescribed or self-selected diet is adequate in vitamin content, medication may destroy the vitamins contained in the ingested food or interfere with their absorption. In the presence of alkalis vitamin C, thiamine, riboflavin and perhaps other vitamins are inactivated. The use of active colloidal adsorbents, such as magnesium trisilicate, aluminum hydroxide and mixtures of these two, in the treatment of peptic ulcer raises the problem as to the amount of vitamins, particularly the water-soluble vitamins B and C, that is adsorbed onto these compounds and excreted without being utilized. This is more than speculation, because such adsorbents are extensively utilized in the isolation and purification of many biochemical substances, including the vitamin B components. Anderson² has demonstrated that the ingestion of liquid petrolatum along with vitamins A and D will cause solution of the vitamins in the oil, with their resultant excretion and nonutilization.

From the surgical aspect, the liberal use of fluids parenterally in the form of solutions of dextrose has contributed a great deal to the production of sub-*vitaminosis* B in patients who have undergone operative procedures on the gastrointestinal tract. The same danger prevails in other states in which parenteral feeding is resorted to for any reason. The excessive amounts of vitamin-free carbohydrate quickly deplete the body's meager stores of the vitamin B complex, and deficiency symptoms appear after several days of parenteral feeding with dextrose. So-called water intoxication, attributed to the excessive administration of fluids parenterally, may often be actually the syndrome of wet beriberi and may respond rapidly to the administration of thiamine hydrochloride in adequate amounts. Production of nicotinic acid deficiency and perhaps deficiency of other components of the vitamin B complex may also follow the prolonged parenteral use of carbohydrate. Hence it is a wise prophylactic measure to administer thiamine hydrochloride, riboflavin and nicotinic acid to all patients receiving fluids parenterally, either by giving the substances separately or by including them in the dextrose solutions.

Among the principal causes of deprivation of vitamins despite an adequate intake are the diarrheal states, especially when of long duration, as in cases of colitis, sprue and intestinal tuberculosis. Dann and Cowgill³ have demonstrated that the experimental production of diarrhea in dogs considerably increases their requirement of thiamine. The diarrheal factors and the manner in which they produce vitamin deficiencies were discussed in a recent paper by Bean and Spies.⁴ They emphasized besides the mechanically increased loss due to rapid passage of the intestinal contents through the body, such other factors as failure of the normal enzymic breakdown of foods because of the decrease or absence of the digestive secretions and the prevention of absorption caused by anatomic changes associated with chronic intestinal disease and diarrhea, such as scarring, induration or inflammation of the intestinal wall. They suggested, in addition, that the phosphorylation of foodstuffs, which is necessary for the activation of vitamins and which takes place in the

intestine, is probably interfered with in diarrhea. Lastly, they pointed out that fever, which coincidentally increases the metabolism and the requirement of vitamins, and symptoms such as nausea and pain reduce the intake of food, with consequent limitation of the intake of vitamins.

From the foregoing remarks one may realize the importance of the gastrointestinal system in the body's vitamin economy, not only as the main route for the introduction of vitamins but also as the means of elution from foodstuffs, absorption and transformation into active forms. The possible development of deficiency states in patients with gastrointestinal disorders must be carefully evaluated, since the onset of a deficiency syndrome usually provokes a vicious cycle; in vitamin B deficiency the absorbing and utilizing powers of the alimentary tract are interfered with, and this progressively exacerbates the symptoms of deficiency. Administration of the entire vitamin B complex and, in addition, any of the synthetic factors, as indicated, is of prophylactic value in all cases of disease of the gastrointestinal tract. In the absence of simple and rapid laboratory tests for vitamin deficiency states, the importance of recognizing the oral manifestations of vitamin deficiency is obvious.

Lesions of the lips, gums, tongue and buccal mucous membranes are characteristic of deficiency of vitamin C and of several members of the vitamin B complex. Response to specific therapy is mirrored rapidly by changes in these lesions. We believe therefore that these early and characteristic phenomena may be used not only in diagnosis but for the evaluation of therapy.

Characteristic oral lesions are commonly observed in deficiency of vitamin C, or scurvy. These, however, are rarely isolated and are usually colored by the presence of other deficiencies. As the function of vitamin C is concerned with the formation and regulation of the intercellular matrix, the gingival lesions are due to a vascular diathesis which produces swollen and boggy gums that bleed easily and progress to actual ulceration. Chewing is difficult, and involvement of the alveolar bones causes the teeth to loosen and fall out. The teeth themselves may be affected by the scorbutic process, the dentin and enamel becoming porous and defective, with resulting rapid and early decay. Hemorrhage into the buccal mucosa may result from the damage to the vascular epithelium.

Investigations thus far have disclosed no oral lesions characteristic of thiamine deficiency. Characteristic stomatitis and glossitis are diagnostic of nicotinic acid deficiency.⁵ These appear early in the course of the disease as swelling and redness of the tip and the lateral margins of the tongue. With the progression of the disease, the reddening becomes more intense until these parts assume a fiery scarlet hue. At the same time ulcerations appear along the sides, the tip and the under surface of the tongue and on the buccal mucosa, particularly opposite the molar teeth. These ulcerations are frequently covered with a thick grayish exudate or membrane in which *Vincent's organisms* can be found. The response to adequate nicotinic acid therapy is often dramatic. Blanching of the fiery redness usually occurs within twenty-four hours, and healing of the ulcerations may be noted in forty-eight to seventy-two hours.

2. Anderson, Oluf: Influence of Liquid Petrolatum on the Absorption of Vitamin A, *Acta paediat.* 24:422, 1939.

3. Dann, Margaret, and Cowgill, G. R.: Influence of Diarrhea on the Vitamin B Requirement, *Arch. Int. Med.* 62:137 (July) 1938.

4. Bean, W. B., and Spies, T. D.: Vitamin Deficiencies in Diarrheal States, *J. A. M. A.* 115:1078 (Sept. 28) 1940.

5. Spies, T. D., and Cooper, Clark: The Diagnosis of Pellagra, *Internat. Clin.* 4:1 (Dec.) 1937.

Gastrointestinal, mental and cutaneous changes which may be present may not manifest equally dramatic response to treatment.

The first distinct clinical picture in man attributed to deficiency of riboflavin was demonstrated experimentally by Sebrell and Butler,⁶ who, by maintaining 18 women with the diet of Goldberger and Tanner, experimentally produced oral pallor followed by maceration and superficial transverse fissuring in the angles of the mouth. These lesions resembled those described as *perlèche*. At the same time a superficial denudation of the mucosa caused the lips to become abnormally red along the line of closure. "In addition to the cheilosis there was also seen a fine, scaly, slightly greasy desquamation on a mildly erythematous base in the nasolabial folds, on the alae nasi, in the vestibule of the nose and on the ears." Under the conditions of the experiment these lesions were alleviated by the administration of synthetic riboflavin but not by nicotinic acid. Since then this deficiency has been found prevalent as a spontaneous condition.⁷ Kruse, Sydenstricker, Sebrell and Cleckley⁸ have reported, in addition, a keratitis associated with these signs of riboflavin deficiency in 10 subjects.

We⁹ have reported on 15 subjects having lesions due, we believe, to ariboflavinosis. In addition to the riboflavin deficiency, 13 had nicotinic acid deficiency, 7 had vitamin B₁ deficiency and 3 had vitamin C deficiency, all clinically manifest. Only 1 patient showed no clinical evidence of another vitamin deficiency. Since then, however, we have observed innumerable subjects, including university students, nurses, dietitians and persons with high incomes, who presented a cheilosis that responded to riboflavin but who showed no clinical evidence of another deficiency disease. It is our belief that ariboflavinosis is the most common isolated deficiency that is objectively manifest.

The facial lesions seen in our cases of riboflavin deficiency consisted of filiform, seborrheic excrescences, in length up to 1 mm. apparently derived from the sebaceous glands and closely to sparsely scattered over the skin of the face. Their characteristic location was in the nasolabial folds, but they occurred frequently on the alae nasi, occasionally on the bridge of the nose and sometimes on the forehead above the eyebrows. The skin on which the excrescences were located was the seat of a fine, scaly, greasy desquamation. On casual inspection these filiform lesions resembled urea frost, but they could not be brushed off by rubbing with the fingers. In addition, most of the patients showed fissures and maceration at the angles of the mouth and a degenerative crustlike formation on the epithelium of the lips, most evident on the lower. The fissures occurred in both angles of the mouth and extended laterally 1 to 3 mm. onto the mucous membrane of the mouth and 1 to 10 mm. onto the skin. They were usually shallow but were sometimes 0.5 mm. deep, and their bases as a rule showed little or no increased red-

ness. In an area extending for 5 to 20 mm. from the angle of the mouth onto both lips, the mucous membrane was macerated, wrinkled and pearl gray. The lips, particularly the lower one, frequently showed a decided increase in the vertical fissuring, often without a break in the mucous membrane. Occasionally the vestibule of the nose was involved, with lesions similar to those on the lips.

The polymorphous nature of the lesions of the tongue and mouth found in patients with frank nicotinic acid and riboflavin deficiency is illustrated by the experience of having the affected areas, particularly the tongue, return to a normal texture and color only after the entire vitamin B complex, or a good diet containing its components, has been administered. Among the patients who still presented stomatitis and glossitis after treatment with nicotinic acid and riboflavin were a number in whom the tongue was smooth, slightly edematous and of a peculiar purplish or magenta hue. Often these patients complained of pain in the tongue. The tongue would return to normal after a sufficient amount of the whole vitamin B complex had been given. With the isolation and synthesis of vitamin B₆, or pyridoxine, it became possible to differentiate a lesion of the tongue that is probably due to a deficiency of this vitamin. The following case history illustrates this type of lesion and the manner in which it originates.

REPORT OF A CASE

D. R., a white woman aged 31, was admitted to our service in March 1940 because of emotional disturbances, with irrationality. There was a history of headaches, fatigue and weakness for two weeks and prolonged heavy drinking. The patient was confused and disoriented. There was bilateral nystagmus. The tongue and buccal mucous membranes were normal. There was no nasolabial dermatitis or cheilosis. The skin and the conjunctivas were moderately icteric. Palpation of the abdomen disclosed that the edge of the liver was firm at the level of the umbilicus, with prominent lateral abdominal veins but no evidences of fluid. The heart and lungs were without significant abnormalities. Treatment with nicotinic acid, ascorbic acid and vitamin A was instituted, while the patient was maintained with a basal diet.

The mental condition slowly improved, but on the third day the patient complained of soreness of the tongue. On examination the tongue was found to be somewhat smooth, most obviously about the edges, and purple-red, or magenta. The lower lip also was of this color, though there was no cheilosis. Thiamine hydrochloride was added to the therapeutic agents, the daily dose of nicotinic acid was increased to 1,000 mg. given orally in divided doses and 200 mg. of sodium nicotinate was given intravenously. This caused no change for the better in the tongue and lips; if anything the magenta coloring of the tongue was intensified, and the patient claimed that her tongue was becoming increasingly painful. On and after the eighth day of the foregoing regimen she was given, in addition, 100 mg. of pyridoxine hydrochloride (vitamin B₆) daily by intravenous injection. By the second day of treatment the soreness of the tongue had almost disappeared and the color had become distinctly lighter. On the fourth day the tongue was almost normal in color, with evidence of new papillae about the center area, which was still somewhat redder than normal. The following day the color had blanched further, and there was definite beginning regeneration of papillae. The lips also at this time had returned to an almost normal color.

The progressive production of characteristic glossitis in a patient maintained with a diet low in the vitamin B complex and supplemented by nicotinic acid, thiamine,

6. Sebrell, W. H., and Butler, R. E. Riboflavin Deficiency in Man. Preliminary Note, *Pub. Health Rep.* 53: 2282 (Dec. 30) 1938.
7. Oden, J. W.; Oden, L. H., and Sebrell, W. H. Report of Three Cases of Ariboflavinosis, *Pub. Health Rep.* 54: 790 (May 12) 1939.
8. Sydenstricker, V. P., cited in Jolliffe, Norman. Clinical Aspects of Vitamin B Deficiencies, *Minnesota Med.* 23: 542 (Aug.) 1940.
9. Kruse, H. D.; Sydenstricker, V. P.; Sebrell, W. H., and Cleckley, H. M. Ocular Manifestations of Ariboflavinosis, *Pub. Health Rep.* 55: 157 (Jan. 26) 1940.
9. Jolliffe, Norman; Fein, H. D., and Rosenblum, L. A. Riboflavin Deficiency in Man, *New England J. Med.* 221: 921 (Dec. 14) 1939.

ascorbic acid and vitamin A and the rapid improvement and return to normal of the tongue when vitamin B₆ was administered constitute, we believe, experimental evidence of a vitamin B₆ (pyridoxine) deficiency.

We have observed, in addition, a stomatitis characterized by the persistence of redness of the mucosa and the presence of many small plaques, looking like milk curds, which could not, however, be washed or rubbed off the mucous membrane. The exact nature of the deficiency causing the stomatitis is not known. We have found this condition in pellagrins as a residuum after the stomatitis due to nicotinic acid deficiency had been healed. It does not respond to treatment with vitamin B₆, riboflavin or nicotinic acid, singly or in combination. Restoration of the mouth to normal was accomplished only after intensive therapy with the vitamin B complex. The factor or factors responsible are present in the vitamin B complex and may be any of the less well known fractions which have not as yet been isolated or synthesized and consequently have not been applied in human nutritional studies.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CROHN AND DROSD AND
DRS. ROSENBLUM AND JOLLIFFE

DR. THOMAS T. MACKIE, New York: Drs. Rosenblum and Jolliffe brought out a fact which needs constant emphasis: that many of the diets which we use in the clinical management are deficient from the point of view of nutrition. I should like to interject a note of caution about the too rigid interpretation of a particular sign and its association with deficiency of a particular crystalline product. I have seen instances presenting the physical signs said to be characteristic of ariboflavinosis that have not responded to heavy dosage of riboflavin until that was supplemented by large doses of brewers' yeast; furthermore, the nasolabial lesions which are described as resulting from ariboflavinosis in the hands of other observers have been described as clearing promptly, within a matter of four or five days, on the administration of nicotinic acid as well as of riboflavin. There is a possibility that the function of these specific factors is interrelated chemically and that the exhibition of one particular substance may lead to the clearing of a particular physical sign, not as a result of the specific action, but as the result of some improvement in general intracellular metabolism. The therapy that I employ whenever I deal with a proved or suspected avitaminosis must recognize that the most important agent is a properly balanced diet and that at the present time the held of usefulness of crystalline products is limited to the meeting of specific indications. One cannot use the shotgun preparations as a substitute for a proper dietary.

DR. W. H. SHEALY, Sharpsburg, Md.: I should like to ask about the treatment of pure Vincent's infection.

DR. LOUIS A. ROSENBLUM, New York: In the treatment of Vincent's angina with nicotinic acid it is important to differentiate between the presence of fusiform bacilli and spirochetes associated with the characteristic nicotinic acid deficiency stomatitis and the true or so-called dental Vincent's angina, which has a typical pseudomembrane and is without the fiery red appearance of the mucous membranes that is so characteristic of nicotinic acid deficiency. Probably the impaired tissue oxidations and other metabolic disturbances that occur in the presence of a deficiency of nicotinic acid provide the approach to the anaerobic environment apparently necessary for the proliferation of the Vincent's organisms; with return of the tissues to a normal metabolic status by the administration of nicotinic acid the organisms disappear and Vincent's angina is cured. But true Vincent's angina not associated with a nicotinic acid deficiency stomatitis does not usually respond to treatment with nicotinic acid.

Clinical Notes, Suggestions and New Instruments

INTERSEXUALITY PROVED BY OPERATION AND MICROSCOPIC EXAMINATION

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It is becoming more widely accepted, as science progresses, that there are few persons who are either wholly male or wholly female but rather that there is a little of the female in all men and a little of the male in all women. The ratio may sometimes be unduly exaggerated and far from the usual normal proportions, which may make it difficult at times to determine whether the individual is basically a male or a female. For this kind of person the term "intersex" has been coined. The case reported here presents one of these problems of intersexuality.

It is not within the province of this report to enter into the theories of formation, suggested mechanisms, hypothetical

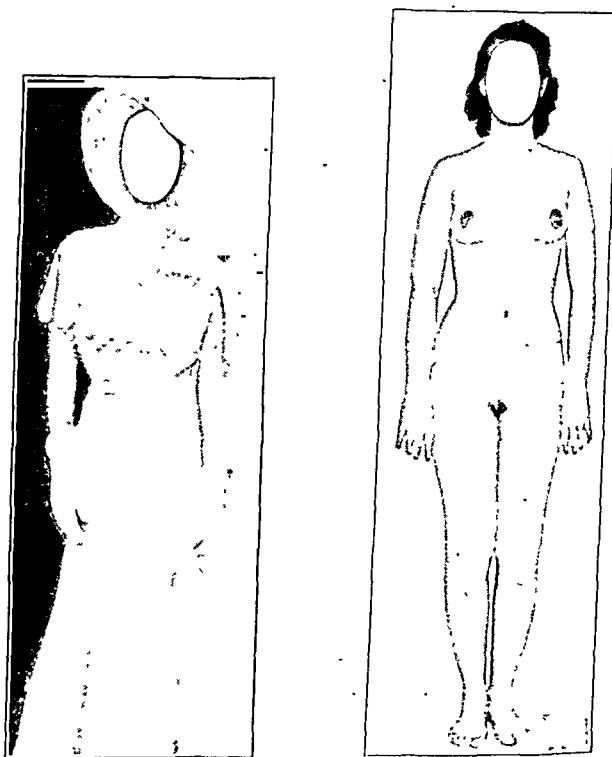


Fig. 1

Fig. 2

Fig. 1.—Appearance of patient a few years before being seen by us.
Fig. 2.—Appearance of patient two months prior to operation. Note absence of pubic hair. The breasts and breast areolae simulate pregnancy as a result of estrogenic therapy.

causative factors or reports of the various classifications of intersexes. For those interested in recently proposed theories and collective reviews of the subject, suitable references are offered.¹ Here, the statement should suffice that immediately

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1. von Neugebauer, F. L.: *Hermaphroditismus beim Menschen*, Leipzig, Dr. Werner Klinkhardt, 1908. Hirsch, E. W., and Jones, T. G.: *A Case of Pseudohermaphroditism in Which Operation Was Performed for Undescended Testes*, J. A. M. A. 92:2018 (June 15) 1929. Allen, Ezra: *Sex Reversal and the Basis of Sexuality*, J. A. Inst. Homeop. 25:908 (Aug.) 1932. Huggins, R. R.; Cohen, M., and Harden, B.: *True Hermaphroditism in a Man, with an Endocrinologic Study*, Am J. Obst. & Gynec. 34:136, 1937. Young, H. H.: *Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases*, Baltimore, Williams & Wilkins, 1937. Rubovits, W. H., and Saphir, William: *Intersexuality*, J. A. M. A. 110:1823 (May 28) 1938. Charvat, J.; Kodacek, E., and Schubert, O.: *Clinical, Hormonal and Histological Conditions in a Case of Hermaphroditism (Fem. Ext.)*, Endocrinology 23:91, 1938. McCarty, J. F.: *A New Concept of Hermaphroditism*, Surg., Gynec. & Obst. 67:646, 1938 (contains a review of 67 reported cases to date); *The Secret*

[Footnote 1 continued on next page.]

after spermatozoal impregnation of the ovum the union and fusion of definite types of chromosomes at once determine the genetic sex of the future individual. (For example, when a spermatozoon containing an x-chromosome fuses with an x-chromosome of the ovum, a potential female offspring may be

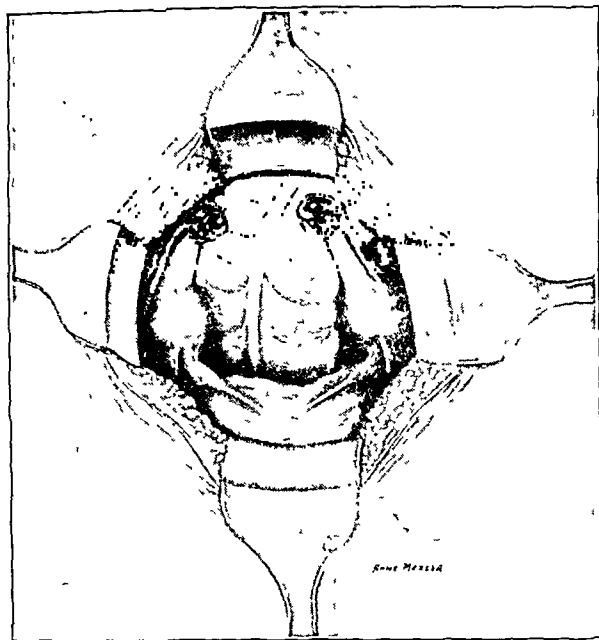


Fig. 3.—Our conception of the patient's pelvic anatomy. This composite drawing was made from a number of photographs none of which singly showed the entire operative field.

assured. Similarly, when a sperm containing a y-chromosome fuses with an x-chromosome of the ovum an individual bearing the characteristics of the male is to be expected.) It should be borne in mind that each fused cell or zygote is potentially bisexual, even though under normal conditions the characteristics of one sex are dominant while those of the other are submerger.

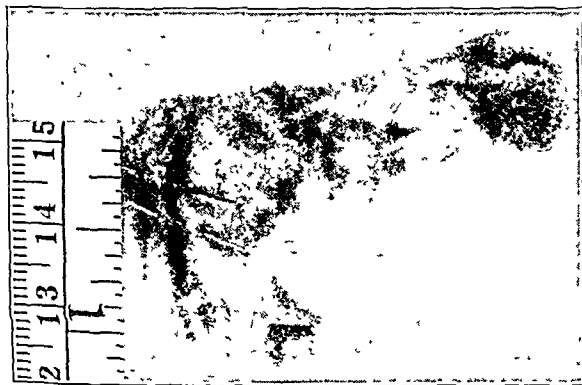


Fig. 4.—The specimen was excised from the right side of the pelvis. The portion that is pinned together is the rudimentary uterus. From it extend the gonad and the fallopian tube.

Why and how at one point of embryologic development a sudden change or switch in the character of the gonads occurs, followed by a subsequent maldevelopment of secondary sexual

and Hermaphroditism, *J. Urol.* **42**:1130, 1939. Mochlig, R. C., and Allen, N. M.: Intersexuality, *J. A. M. A.* **112**:1938 (May 13) 1939. Kell, R. C.; Matthews, R. A., and Bockman, A. A.: True Hermaphroditism; Report of a Confirmed Case, *Am. J. M. Sc.* **197**:825, 1939. Schiller, W.: Congenital and Acquired Sex Changes, *Internat. Clin.* **3**:86 (Sept.) 1940 (contains an interesting review of the entire subject). Imkler, R. S.: Pseudohermaphroditism, Pregnanliol Glucuronidate Excretion, *J. Clin. Endocrinol.* **1**:151, 1941.

factors with endocrine rearrangement, cannot yet be answered. A true explanation is not forthcoming for this sudden twist of nature.

The following report was prompted by Novak's² record of an unusual instance of intersex. Owing to the fact that our case of intersexuality presents much in common with his, the case herein reported was carefully followed for three years and the report is submitted together with important operative and histologic observations. We agree with Novak that when such case presentations of intersexuality are prepared in the proper manner they can add much clarity to the befuddled status of the intersexes. Speculative reports on "evidences of hermaphroditism" based on imagination, presumption and "wishful thinking," such as were reported up until a few years ago, are not only unscientific but misleading.

REPORT OF CASE

History.—A housewife aged 29, of American descent, appeared before one of us on June 6, 1938 with a vague complaint of



Fig. 5.—Section under low power magnification of the patient's normal fallopian tube.

abdominal pain. She also complained of headaches and dizziness. The fact that she had never menstruated did not seem to concern her much.

In her family history one interesting feature was the fact that her sister, two years younger than the patient, had also never experienced a menstrual period. A brother and two other sisters are married and have children.

The patient's infancy was normal and she experienced the routine childhood diseases as she approached adolescence. When she was 16 years of age she was examined by a local physician, vaginally and rectally, to ascertain the cause of her amenorrhea. Her family was told that the young girl was born somewhat different from other girls in that she did not possess a uterus. At about this time she commenced to suffer with backaches, abdominal cramps and headaches. She was still suffering with the abdominal cramps and headaches when first seen by us some thirteen years later. Her weight in adolescence had ranged between 95 to 100 pounds (43 to 45 Kg.). In the year

2. Novak, Emil: Sex Determination, Sex Differentiation and Intersexuality, *J. A. M. A.* **105**:413 (Aug. 10) 1935.

prior to our first seeing her she gained approximately 25 pounds (11.3 Kg.), making her weight about 125 pounds (56.7 Kg.) when she was first seen.

She had never had any sexual desire for the opposite sex and, although she had been married for eight years, she never experienced any sex urge toward her husband.

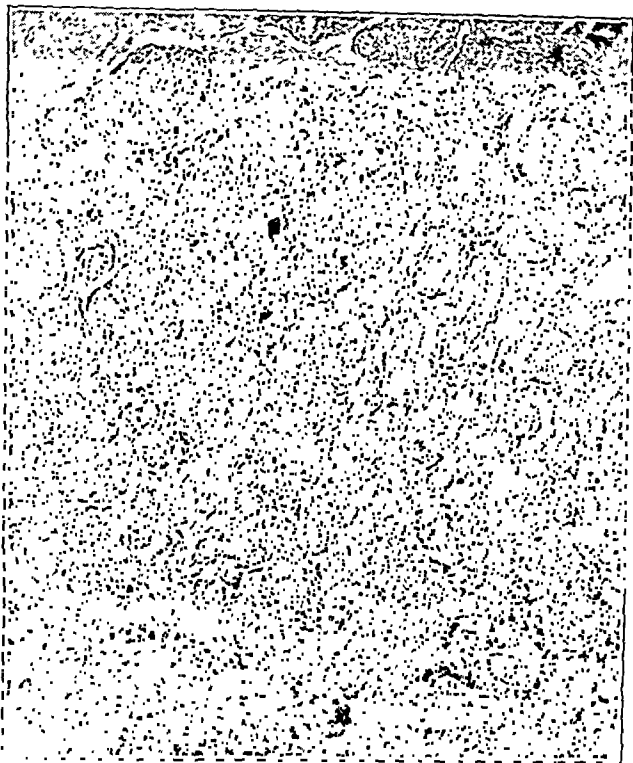


Fig. 6.—Section under low power magnification of gonad (testis) taken from patient, showing numerous interstitial cells.

She has few interests in life and does her own housework. She attends the movies occasionally and has a few women friends. She is quite attractive, has feminine charm and is of a very pleasant nature. She is neither bothered nor depressed about her amenorrhea; she would like to have children although she realizes that this is quite an impossibility. She dresses effeminately and with true girlish style. Her mentality is good.

Physical Examination.—General Appearance: The patient is white, of the Anglo-Saxon type, is 62½ inches (159 cm.) tall, weighs 124 pounds (56.2 Kg.) nude, and has normal and abundant blonde hair on her head and eyebrows but complete absence of axillary, pubic, perineal and anal hair. Her stature is slightly lordotic in the lumbosacral area of the spine, and her bony framework is light and thin. There is an excess of fat over the lower part of the abdomen and buttocks. The temperature, pulse rate and respiratory rate are normal.

Skin: Her skin is soft and pale, is covered with lanugo and has the soft tender touch similar to that of the skin of an infant. There are no acneiform lesions, lentigines, moles, warts or blemishes of any type. The skin about the vulva and rectum is scarcely pigmented and is of the same consistency as the rest of the skin. Her scalp is dry and the hair on her head is blonde and soft. When first seen, the breast areolas lacked pigmentation and the nipples were absent. The breasts were smaller than normal and the glandular consistency was abnormal.

Head and Neck: Her eyes are blue and the lashes are long. No abnormalities are noted except for two large central incisors in the upper set of teeth. Engelbach used this sign as being diagnostic of hypo-ovarianism.

Chest: Her bony thorax is small and delicate. The heart and lungs are essentially normal. The blood pressure is 90 systolic and 46 diastolic. Axillary hair and breast nipples are absent.

Abdomen: There is a layer of fat over the abdomen about 1½ inches in thickness. There are no scars, masses, tenderness, rigidity or pain on palpation. The abdominal aorta is easily palpable owing to an anterior curvature of the spinal column.

Extremities: The upper and lower extremities are fairly normal, although somewhat longer than usual.

Genitals: There is an absence of the normal pubic hair over the mons pubis. The labia majora and minora are smaller than usual. Although the clitoris is present and is normal in size, there is no erection of this organ on stimulation. There is also an absence of sexual excitation on palpation of the clitoris. The vestibule is normal and contains the openings of the urethra, vagina and accessory glands. There are no remnants of a hymen. The vagina, although its external opening is of normal size, is short in depth. On bimanual examination there is no cervix dipping into the vagina, nor is there a uterine body palpable. The ovaries and fallopian tubes are also not palpable. The posterior vaginal vault is so taut that it is difficult to feel much of anything through the vagina. A rectovaginal examination revealed no further information. Examination of the vagina with a speculum disclosed the similarity of the vaginal canal to a blind pouch. There is no cervix, os or anything resembling a cervix or os uteri. There is no opening into the abdominal cavity. The vaginal pH, as determined with nitrazine paper, ranged between 4.5 and 5.

Laboratory Reports.—The basal metabolic rate was minus 4; Wassermann reaction, negative; complete blood count, normal; urine, normal; blood sugar, 71 mg. per hundred cubic centimeters of blood; blood nonprotein nitrogen, 32 mg. per hundred cubic centimeters of blood; vaginal pH, between 4.5 and 5. Cellular study of vaginal washings did not seem abnormal; urinary estrogen and gonadotropic substance and blood estrogen and gonadotropic substance (serum) showed no increase over



Fig. 7.—Higher magnification showing immature seminiferous tubules in gonad of patient.

normal; a roentgenogram revealed no abnormalities; roentgen examination of the transabdominal pneumoperitoneum showed no signs of the presence of the uterus in the pelvis or abdomen.

Impressions.—At this time (before any therapy was started in 1938) the impressions gained were as follows: (1) primary

hypo-ovarianism, (2) congenital absence of uterus, (3) absence of breast nipples, (4) absence of axillary, pubic, perineal and anal hair.

At this time, the case was first reported in the literature as being illustrative of primary hypo-ovarianism with congenital absence of the uterus.³ For a period of eighteen months following the first report she was carefully watched and studied. In order to stimulate her libido and to attempt to render her life more normal, she was given estrogenic substances⁴ and later diethylstilbestrol.⁵ These substances were hugely successful in increasing the size of her breasts and nipples and in stimulating a new sense of sexual desire not previously experienced.

All during this time she continued to complain of the vague pain in the lower part of the abdomen, which at times became more severe directly over McBurney's point. This manifestation was considered separate from her other disorders and was assumed to be due to a mild form of recurrent appendicitis. She was cautioned that if some day she should experience a severe attack of this pain her appendix would have to be



Fig. 8.—Ductus deferens-like structure which was closely associated with the testis.

removed and at the same time inspection of the pelvic organs would be undertaken.

On March 25, 1940, after all estrogenic therapy had been discontinued for about two months, she appeared at the office of one of us with a severe right-sided abdominal pain. The long-awaited opportunity for appendectomy and exploratory laparotomy was at hand. She was accordingly admitted to the Jewish Memorial Hospital, where she was soon operated on.

Operation (Gynecology Service of Dr. Edward Hoenig).—A right rectus incision was made and the appendix, which was hyperemic and inflamed, was located. It was excised by the clamp and cautery method. The pelvis was next explored and a most unusual peculiarity presented itself (fig. 1): The bladder was found but there was no uterus in relation to it. Instead,

extending upward and laterally from the bladder on each side of the pelvis was a ligamentous cord, the upper end of which was attached to a small muscular organ about the size of a chestnut. These cords resembled bilateral rudimentary uteri. From each of these small bodies a thin fold extended to the lateral pelvic walls. These were probably vestigial broad ligaments. Within the broad ligaments and on each side was what appeared to be a fallopian tube in close association with each muscular body. Lying within the upper portion of each of the broad ligaments was a gonad. These gonads were similarly coated with a whitish capsule and were attached to the upper poles of the rudimentary uteri. There were no graafian follicles present in either gonad and the gonads seemed to be quite peculiar and atrophic. The uppermost ends of the broad ligaments were marked by clusters of small cystic nodules. The entire mass on the right side was removed for study. The other side was left intact, since we felt that total castration could do no good. Moreover, it was quite possible that even if a gonad appeared atrophic it might still have some endocrine function.⁶ The department of pathology examined the specimen and its interesting and unusual observations are here reported.

Pathologic Examination.⁷—Gross: The specimen consisted of a V shaped mass measuring about 3 cm. in length in one axis and about 4 cm. in the other (fig. 2). The external surface was covered with a somewhat thickened and smooth serosa. A thin walled cyst, measuring about 0.5 cm. in diameter, was attached to one end of the specimen. On section through the smaller axis a whitish mass with somewhat fibrous structure could be seen. On section through the other extremity of the specimen the cut surface showed a rather thick, grayish white capsule and grayish red stroma. A rounded yellowish area measuring about 2 mm. in diameter was present in this portion of the specimen, the cut surface of which was smooth. Attached to the longer axis was a fallopian tube which showed externally and on section no gross pathologic condition.

Microscopic: Sections from the thick musculature of the organ suggested an atypical uterus, owing to the presence of intertwining, closely placed, rather hypertrophic bundles of smooth muscle with distinct simulation of the uterine wall. The included blood vessels showed sclerosis and thickening. No endometrium was included in the sections.

Section through the fallopian tube (fig. 3) showed folded mucosa with characteristic ciliated epithelium and muscle structure. In the wall was some aberrant glandular tissue with adjacent closely placed muscle tissue. One area showed a large cystic space with low cuboidal epithelium resembling a hydatid.

Section of a gonad showed typical undifferentiated immature testicle structure with considerable intervening fibrosis (fig. 4). The capsule corresponding to the tunica albuginea was thickened and showed some smooth muscle. The bulk of the tissue was occupied by seminiferous tubules without differentiation of lining epithelium (fig. 5). The cells showed columnar arrangement with orientation at the nuclei. In none of the tubules could any attempt at differentiation or spermatogenesis be seen. In the stroma, wide islands of interstitial cells were prominent. These cells contained considerable lipochrome. Sinusoidal areas with an erectile appearance were also present in the stroma of the gonad. No ovarian stroma was seen in any of the sections.

One of the sections close to the gonad showed tissue resembling ductus deferens structure (fig. 6) by close approximation of developed smooth muscle and central epithelial lining.

SUMMARY

A patient exhibiting unusual intersexuality had all the aspects of a female but her gonads were definitely abnormally retained immature testes, and there was complete absence of ovarian tissue. Sufficient numbers of complete reports of such cases, when carefully studied, may be capable of eventually explaining the etiology of such unnatural switches in nature.

3. Weisman, A. I.: Complete Absence of the Uterus, *M. Rec.* 150: 392, 1939.

4. Weisman, A. I.: Breast Development from Estrogenic Hormones, with Report of a Case of Primary Hypo-Ovarianism, *M. Rec.* 151:391, 1940.

5. Weisman, A. I.: Rapid Breast Changes from Stilbestrol, *Clin. Med. & Surg.* 48:146, 1941.

6. Despite the fact that one gonad was left intact, the patient has since commenced to suffer with severe hot flushes that are typical of the menopause. Repeated and large doses of estrogenic therapy have been necessary to control these attacks since the operation.

7. From the laboratory of Dr. Alfred Angrist.

PROGRESSIVE SUBCORTICAL ENCEPHALOPATHY

(ENCEPHALITIS PERIAXIALIS DIFFUSA; SCHILDER'S DISEASE)

JOHN J. O'DONNELL, M.D., ERIE, PA.

The following conditions are rarely if ever found in combination, namely a rare disease, a fairly exact measurement of intelligence before and after the onset of the disease and the confirmation of diagnosis at autopsy. All these conditions are present in the case herewith reported.

REPORT BY SCHOOL PSYCHOLOGIST

Zoe I. Hirt, school psychologist of the child study department, Erie, Pa., contributed the following history, obtained from the mother of the patient, E. S.:

The father was an alcoholic. The mother had pneumonia when seven months pregnant. She was threatened with an abortion and spent two weeks in bed. The child was born at full time, a blue baby. He had respiratory difficulties until his tonsils and adenoids were removed at the age of 3 years. At the age of 4 years he had infected ears and was treated in the hospital for two weeks. At 6 he fell from a garage roof and broke one of his arms just below the shoulder. His mother expressed the belief that his head was injured by the fall. A year later he was struck on the head by a horseshoe. The blow left a deep cut which was slow to heal. In the spring of 1939 he had severe ivy poisoning.

In November 1938 when the boy took the Kuhlmann-Anderson group intelligence tests with his fifth grade class he ranked second among 26 pupils, his intelligence quotient on that scale being 107. His conduct in school was excellent and his personal appearance good.

On June 11, 1940 the assistant principal of East High School sent him in for a psychologic examination because of his undesirable conduct. The complaints were frequent truancies, stubborn refusal to participate in class activities and recitations, failure to prepare and hand in assignments for out of class study, unwillingness to take part in classroom activities, disorderly conduct in the school corridors, remaining away from home until late at night, wandering aimlessly around the streets, destructiveness at home and outside, untidiness at meals, pushing his food from his plate and extreme restlessness.

On examination the boy was neat in appearance but had a shuffling gait and was restless, shifting his position continually from the back of his chair to the edge of the seat and rubbing and scratching his arms and wrists. Every little while he would hold the index finger of his right hand in front of his mouth and blow against it. His speech was thick, and at times he stuttered. Verbal responses were slow. Questions had to be repeated, sometimes over and over. When asked to explain his undesirable conduct in school he said "I want to fail; I can't do seventh grade work; it's too hard."

Form L of the 1937 revision of the Stanford-Binet scale was used to investigate his mental equipment on June 11. He succeeded with all the tasks at year 7 and above that level with additional items scattered thinly as far as year 12. He lacked barely one month of being 13, and his only successes at the 12 year level were in two vocabulary items. He could not retain more than five digits for immediate recall after he heard them. He could not read a word of the little paragraph printed under year 10 on the test scale. It was obvious that he could not see the words, so a first reader selection in large type was placed before him. After much effort, holding the page close to his eyes, he read "A boy ran along" instead of "A boy had a dog." He could not keep his place on the page as he continued to read the little selection. He said that he should receive a nickel in change if he gave a storekeeper 15 cents in payment for a 12 cent article. He thought that his change should be 14 cents from a quarter if he bought some-

thing costing 4 cents. He repeated the same five or six words over and over when asked to name all the different words he could think of in a minute. He seemed totally lacking in critical judgment. The sum of his correct responses in the test gave him an intelligence quotient of 63.

HOSPITAL REPORT

E. S. was admitted to Hamot Hospital Oct. 13, 1939 with cellulitis of the floor of the mouth. He had had an upper molar on the right side extracted five days before. The day after extraction he began to have swelling on the under surface of the mandible on the right side. The swelling gradually became enlarged and though not inflamed was extremely tender to touch. The next day he began to have chills and weakness. His mother applied ice bags to his jaw and forced fluids. The chills had persisted, but the swelling on the jaw had not altered much since three days before admission.

The Wassermann and Kline reactions of the blood were negative and the blood counts normal. The temperature on admission was 102.2 F., but it rapidly subsided under treatment with 15 grains (0.9 Gm.) of sulfanilamide and 10 grains (0.6 Gm.) of sodium bicarbonate every four hours.

The patient was discharged as cured on October 23.

On June 12, 1940 he came to the neuropsychiatric clinic, and he was admitted to the ward for study. He had an unsteady gait, failing vision and a dull mentality.

On physical examination he appeared well developed and nourished. Neurologic examination revealed that the pupils were regular, dilated and reactive to light and in accommodation. The visual acuity admitted by the patient was 20/100 in each eye. Tests of refraction revealed that there was small hyperopic astigmatic correction, and on prodding the examiner could get the patient to read with a 20/50 acuity in each eye. Fundus examination gave normal results throughout. There was very pronounced concentric contraction of the visual fields but no significance in the boy's responses. Examination of the eyes revealed nothing of definite significance from the diagnostic standpoint.

The speech was slow. There was no restriction of the tongue or the palate and no stiffness of the neck. The tendon reflexes were increased. The epicritic and deep sensibility was increased. There was no Babinski, Gordon, Oppenheim or Chaddock reflex, but Romberg's sign was present. The gait was spastic. There were incoordination of the arms and legs and past pointing. The abdominal and cremasteric reflexes were normal. Kernig's sign was not present. The vibratory sense was normal. The patient was unable to do the heel to shin and toe to finger tests.

On examination of the spinal fluid the pressure was 6 and the cell count 4. There was a slight increase in the globulin content. The Wassermann reaction was negative. The blood showed a hemoglobin content of 86 per cent, 6,700 leukocytes and 5,320,000 erythrocytes. The color index was 0.8. The Wassermann and Kline reactions of the blood were negative.

Roentgen examination revealed that the bones of the skull were of normal density and thickness. No abnormal shadows were seen, and there was no evidence of increased intracranial pressure. The sella turcica was small and of the enclosed type. Nothing was seen to indicate pressure or change in the bone in this region. The sphenoid sinus was large.

With the foregoing data, tumor of the brain could be ruled out with some degree of certainty. The mental deterioration, failing vision and spastic gait being taken into consideration, a diagnosis of progressive subcortical encephalopathy (Schilder's disease, or encephalitis periaxialis diffusa) was made. The boy was sent home June 17.

During the interval between the patient's discharge and readmission to the hospital I saw him at home once a week. The vision became progressively worse, and there was more dulling of intelligence.

He was sent into the hospital on August 4. On admission he was apparently unconscious, the neck was rigid and retracted

The laboratory studies and autopsy were done by Dr. E. L. Armstrong, the ophthalmic examination by Dr. James Delaney and the roentgen examination by Dr. B. Swayne Putts.

and the whole body would jerk most of the time. The eyes were open but sightless. The boy would cry from pain.

At this time the deep tendon reflexes were lost. Kernig, Babinski, Gordon, Oppenheim and Chaddock reflexes were present bilaterally. Opisthotonos was present at times and incontinence of the bowels and the bladder. Stertorous respiration was constant. Only a small amount of fluid was taken. The patient was unable to swallow solids. The temperature was between 99 and 104 F., and he was in a stupor at all times.

The only medication given was morphine to relieve pain. Death occurred on August 19.

AUTOPSY REPORT

External Examination.—The body was emaciated. The height was 63 inches (160 cm.) and the weight approximately 80 pounds (36.3 Kg.). The superficial layers of the skin of the trunk were raised in tiny blebs that brushed off easily when the skin was rubbed. These blebs were filled with clear watery fluid. No edema or jaundice was noted and no enlargement of the superficial lymph nodes. No scars or marks of injury were seen on the body surface. The joints throughout the body appeared fixed, apparently from prolonged muscle spasm.

Eyes: The pupils were unequal but regular, and both were dilated. The left pupil was 7 mm. and the right 8 mm. in diameter.

Internal Examination.—**Brain:** On removal of the skull cap the vessels of the meninges were seen to be everywhere injected. No gross hemorrhage was present and no free exudate was seen over the surface of the brain. On serial section the white matter throughout the brain showed dilated vessels and apparently minute areas of hemorrhage. No gross degeneration or abscess formation was noted.

The dura was stripped from the base of the skull and the sinuses and middle ears examined. The mastoid cells and the middle ear on the left side were filled with a yellowish mucopurulent secretion. The right middle ear and mastoid cells were dry, as were the bony sinuses.

Thorax: On removal of the chest wall both lungs lay free. There was no free fluid in the pleural cavities. The lungs were crepitant throughout and showed no evidence of consolidation. No hemorrhage was noted beneath the pleura.

Heart: The amount of pericardial fluid was not increased. Examination of the myocardium and the heart valves revealed nothing remarkable.

Abdomen and Pelvis: Gross examination of the organs in the abdomen and the pelvis revealed nothing definitely pathologic.

Bacterial Flora: Smears of material from the left mastoid cells showed many staphylococci and numerous short chain streptococci. Cultures of material from the brain surface were sterile, as were cultures of the blood.

Microscopic Examination of Brain.—Fourteen blocks were taken from different areas in the cerebral and cerebellar cortex. In examination of these sections the following microscopic changes produced by progressive subcortical encephalopathy were noted:

1. The myelin sheaths of the white matter were destroyed and in places disintegrated. This was particularly noticeable in the sections of cerebral cortex and at a few points was noted to extend into the margins of the gray matter. Multiple foci were observed.

2. The perivascular spaces were greatly enlarged from retraction of the surrounding neuroglial tissue.

3. There were diffuse perivascular accumulations of lymphocytes, with scattered plasma cells. In some sections this perivascular infiltration was dense and was seen not only in the vessels lying deep in the white matter but in the meninges.

The anatomic diagnoses were (1) hyperemia and engorgement of the meningeal vessels and (2) the presence of free pus in the left mastoid cells and the left middle ear. The cause of death was progressive subcortical encephalopathy.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.
THEODORE G. KLUMPP, M.D., Secretary.

HALOGENATED VEGETABLE OILS FOR BRONCHOGRAPHY AND THE PROBLEM OF LIPID PNEUMONIA

The manufacturer of a preparation of iodine and chlorine in peanut oil for intratracheal administration as a bronchographic medium has recently called attention to the following statement occurring in the editorial "Lung Irritation Following the Use of Certain Oil Preparations" (THE JOURNAL, April 26, 1941, p. 1911): "Several of the vegetable oils, notably croton oil, castor oil and peanut oil, are exceedingly active irritants of tissues." The manufacturer points out that this statement has led to inquiries from physicians which indicate that members of the medical profession do not understand that this statement does not apply to refined grades of peanut oil from which irritating unsaturated fatty acids have been eliminated, such as the completely saturated halogenated product which it manufactures.

The editorial containing the statement in question was based on a previous report by Dr. Paul R. Cannon (The Problem of Lipid Pneumonia, THE JOURNAL, Dec. 21, 1940, p. 2176), published under the auspices of the Council on Pharmacy and Chemistry, which deals primarily with the promiscuous intranasal use of oily inhalants, particularly those containing liquid petrolatum. Regarding the manufacturer's point that saturated peanut oil is not as irritating as the crude unsaturated oil, Dr. Cannon explains that, while it appears reasonable that complete saturation with removal of free fatty acids should eliminate some of the irritating properties of this and other vegetable oils, the problem has not been adequately studied. He emphasizes, however, that this problem should not be confused with that of lipid pneumonia resulting from the constant use of nasal oil drops, since, even if slightly irritating, halogenated oils for bronchographic study are used relatively infrequently and then only under the supervision of a roentgenologist.

The Council concurs with the view expressed by Dr. Cannon that the problem of lung irritation from the use of oils other than petrolatum needs further study, especially from the standpoint of inhalant preparations which are subject to unsupervised use by the public.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

THEODORE G. KLUMPP, M.D., Secretary.

EPINEPHRINE (See New and Nonofficial Remedies, 1941, p. 251).

SOLUTION OF EPINEPHRINE HYDROCHLORIDE 1:1,000-LAKESIDE.—A brand of solution epinephrine hydrochloride-U. S. P. containing chlorobutanol 0.5 per cent and sodium bisulfite 0.1 per cent in physiological solution of sodium chloride, saturated with carbon dioxide.

Manufactured by The Lakeside Laboratories, Inc., Milwaukee.
Solution of Epinephrine Hydrochloride 1:1,000-Lakeside, 1 cc. ampule.
Solution of Epinephrine Hydrochloride 1:1,000-Lakeside, 30 cc. rubber stoppered vial for parenteral administration.

McKESSON'S NATURAL VITAMINS A AND D IN OIL, 6 CC.—A concentrate of vitamins A and D prepared from medicinal cod liver oil, the concentrate containing not less than 60,000 U. S. P. units of vitamin A and not less than 10,000 U. S. P. units of vitamin D per gram.

Actions and Uses.—It possesses the therapeutic properties recognized for the vitamins present in cod liver oil.

Dosage.—Six drops per day. Larger dose as prescribed by the physician.

Manufactured by the International Vitamin Corporation, New York. (McKesson & Robbins, Inc., Bridgeport, Conn., distributor.) The vitamin D concentrate used is made under U. S. patent No. 1,690,091 (Oct. 30, 1928; expires 1945).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 27, 1941

A CALL TO THE MEDICAL PROFESSION

The nation is at war. The Congress has passed an amendment to the Selective Service Act which will call for registration of every man up to the age of 65 and which will place all men under 45 years of age subject to service at the order of the Selective Service boards.

The Procurement and Assignment Service for Physicians, Dentists and Veterinarians was established by order of the President on October 30. Thus the medical profession itself aids in determining proper distribution of the medical profession in supplying the needs of the armed forces and maintaining medical service to civilian communities, public health agencies, industrial plants and other important needs.

At a meeting of the Procurement and Assignment Service held in Chicago at the headquarters of the American Medical Association on December 18 jointly with the Committees on Medical Preparedness of the American Medical Association, the American Dental Association and the American Veterinary Medical Association, plans were drawn for making immediately available to the United States Army and Navy Medical Corps the names of physicians who wish to be enrolled promptly in the service of the government in this emergency.

On the opposite page is published a blank by which every physician may at once place his name with the Procurement and Assignment Service as one who is ready to serve the nation as the need arises. If you wish to make yourself available for classification, fill out this blank and send it at once to Dr. Sam F. Seeley,

Executive Director of the Procurement and Assignment Service. When these blanks are received, they will be classified and checked with the information available in the national roster of physicians at the headquarters of the American Medical Association.

For two thousand and nine counties in the United States, lists have been prepared indicating physicians who are engaged in necessary civilian projects, public health services or educational activities from which they cannot be spared. Shortly the rest of the counties will have such lists available.

In each of the corps areas covering the United States a committee is being established, including representatives of medical, hospital, educational, dental and veterinary activities. In the individual states, committees of medical, dental and veterinarian professions are being established through which the corps area committees will exercise their functions. In each county also local committees will provide accurate information regarding the status of each member of the profession concerned.

The raising of the Selective Service age from 28 to 45 will place a great number of additional physicians in the category of those on whom the nation may call as their services are needed. Estimates indicate that some sixty thousand physicians thus become available for service and that forty-two thousand dentists under the age of 45 also become subject to call. By enrolling with the Procurement and Assignment Service immediately, utilizing the blank on the opposite page, all physicians, but particularly those under 45 years of age, insure to every extent possible assignment to the type of service for which they are best fitted. They avoid thus also the possibility of unclassified service with the United States Army during the period that may be necessary following selection by the Selective Service before the commission can be secured. A physician called by the Selective Service who has not enrolled or who is not on a reserve list obviously serves without a commission during the time that necessarily elapses before a commission is secured. In future issues of THE JOURNAL announcements will be made regularly of the numbers of those who enroll and of the extent to which the immediate needs of the Army, Navy and other government agencies are being supplied.

ENROLMENT FORM FOR PROCUREMENT AND
ASSIGNMENT SERVICE FOR PHYSICIANS

Dr. Sam F. Seeley, Executive Officer
Procurement and Assignment Service
New Social Security Building
4th and C Streets S.W.
Washington, D. C.

Dear Doctor Seeley:

Please enroll my name as a physician ready to give service in the Army or Navy of the United States when needed in the current emergency. I will apply to the Corps Area commander in my area when notified by your office of the desirability of such application.

Signed _____

1. Give your name in full, including your full middle name:
2. The date of your birth:
3. The place of your birth:
4. Are you married or single?
5. Have you any children? If so, how many?
6. Do you believe yourself to be physically fit and able to meet the physical standards for the Army and Navy Medical Corps?
7. Have you filled out previously the questionnaire sent to all physicians by the American Medical Association?
8. When and where were you graduated in medicine?
9. In what state are you licensed to practice?
10. Do you now hold any position which might be considered essential to the maintenance of the civilian medical needs of your community? If so, state these appointments:
11. Have you previously applied for entry into the Army or Navy Medical Service? If so, state when, where and with what result (if rejected, state why).

Signature _____

Date _____

Address _____

Fill out this blank, tear out and send to Dr. Sam F. Seeley at the above address.

CONGRESS ACTS TO SAFEGUARD USERS OF INSULIN

Congressional action on legislation to protect the users of insulin was completed on December 19. Prompt action was necessary because the patent on insulin, held by the University of Toronto, under which patent adequate standards of purity and strength have been maintained, expired on December 23.

The legislation that has been enacted amends the Federal Food, Drug and Cosmetic Act by declaring a drug to be misbranded if it is, or purports to be, or is represented as a drug composed wholly or partly of insulin unless (1) it is from a batch with respect to which a certificate or release has been issued under regulations to be promulgated by the Federal Security Administrator and (2) such certificates or release is in effect with respect to such drug. The Federal Security Administrator is directed to provide for the certification of batches of drugs composed wholly or partly of insulin. A batch of any such drug, the legislation provides, shall be certified if the drug has such characteristics of identity and such batch has such characteristics of strength, quality and purity as the Administrator prescribes in such regulations as necessary adequately to insure safety and efficacy of use. Prior to the effective date of such regulations, the Administrator is authorized, in lieu of certification, to issue a release for any batch which, in his judgment, may be released without risk as to the safety and efficacy of its use. Regulations providing for such certification must, among other things, contain provisions prescribing (1) standards of identity and of strength, quality and purity, (2) tests and methods of assay to determine compliance with such standards, (3) effective periods for certificates and other conditions under which they shall cease to be effective as to certified batches and as to portions thereof. The regulations, the legislation provides, shall prescribe no standard of identity or of strength, quality or purity for any drug different from the standard of identity, strength, quality or purity set forth for such drug in an official compendium such as the United States Pharmacopeia or similar publication. The Pharmacopeia has adopted standards for insulin.

In explaining the purpose of the legislation and the urgency of the need for immediate action, Representative Lea of California made this statement on the floor of the House of Representatives:

There is an emergency situation that caused our committee to act on this bill at the present time. The report before the House represents the unanimous opinion of the committee.

The patent on insulin expires on the 23d of this month. Control of the manufacture of insulin is in the hands of the University of Toronto. The patent is owned by the University of Toronto, and manufacturers in the United States act under license from the committee on insulin of that university.

Control of insulin quality by the University of Toronto has been most commendable. That control has been on a nonprofit, humane and scientific basis. It has required that all manufacturers comply with the standards set up by the committee

on insulin in order to engage in its manufacture or sale. This control was through ownership of the patent right.

On expiration of the patent, present control over the situation will cease and manufacturers in this country would be at liberty to manufacture and place insulin on the market in disregard of that uniform standard of quality and strength that are so essential for the protection of users of insulin.

Over one million people in the United States are now under insulin treatment. It is estimated they are spending about \$15,000,000 a year for this remedy. Ordinarily the doctor gives the patient a prescription, who after that buys from any drug store available. So far the afflicted person has had the protection that is given by a uniform standard and strength under the restrictions imposed by the owners of the patent.

The effect of insulin is such that injury and death may result from taking too much or too little. The peril to the public that would ensue from the lack of a uniform standard would be primarily due to the variation and uncertain quality as to strength and purity unless its standardization is assured by the federal government acting through the Food and Drug Administration.

Under the amendment here proposed to the Food, Drug and Cosmetic Act, every batch of insulin would be submitted to tests to assure its freedom from infection, its purity and strength. Each batch would be subject to approval of the Food and Drug Administration and rejected if not of a properly standardized quality. By this means all users of insulin suffering from diabetes can be assured of the quality, the standard, strength and purity of their purchases.

The procedure required in making tests, the adoption of regulations to control such tests and the certification thereof by the Food and Drug Administration will conform to the practice that already prevails in requiring such tests, and issuing such certificates as to certain coal tar products.

THE FORMATION OF URINE

The early studies of Bowman, who maintained that the glomeruli of the kidney acted as filters and the cells of the tubules as secreting agents, together with the work of Heidenhain, who championed the conception that the formation of urine was entirely a secretory process, and the ideas of Ludwig, who thought that a process of absorption might occur in the tubules of the kidney, contribute interesting early chapters in the story of renal function. The more modern view so well expressed by Cushny,¹ according to which the excretion of urine involves simple filtration in the glomeruli coupled with selective reabsorption in the tubules, is now familiar. The classic work of Wearn and Richards,² who some two decades ago collected glomerular urine directly from Bowman's capsule in the living frog kidney by means of a capillary pipet, opened a new route of attack on the problem of glomerular and tubular function. Since that time methods have been developed for the collection of fluid from single tubules of the amphibian kidney, and the analysis of the minute amounts of fluid collected has been accomplished. The results of these studies has lent powerful support to the filtration-reabsorption theory of urine formation.

The mammalian kidney has now been successfully used in this type of study. In recent reports, Walker

1. Cushny, A. R.: *The Secretion of the Urine*, ed. 2, New York, Longmans, Green & Co., Ltd., 1926.

2. Wearn, J. T., and Richards, A. N.: *Observations on the Composition of Glomerular Urine, with Particular Reference to the Problem of Reabsorption in the Renal Tubules*, *Am. J. Physiol.* 71: 209 (Dec.) 1924.

and his co-workers³ describe their interesting experiments on the kidneys of anesthetized animals, particularly rats and guinea pigs. These investigators were able to collect amounts of fluid sufficient for quantitative microanalysis from a single glomerulus, proximal tubule and distal tubule. By a procedure involving microdissection of the nephrons, the precise site of the collection could be identified. Unfortunately, only in guinea pigs could glomeruli be found which were accessible for study. Certain portions of the proximal and distal tubules in guinea pigs, rats and other mammals are conveniently located with regard to the possibility of collecting fluid from them. Analyses of glomerular fluid reflect the filtering function of the glomerulus. While little or no protein was found in the glomerular filtrate, it did contain reducing substances and creatinine in concentrations similar to those existing in blood plasma. The reducing substances are reabsorbed as fluid flows through the proximal tubule. The site of dextrose absorption is therefore the same in the mammalian and the amphibian kidney. At least two thirds of the fluid also appears to be resorbed within the proximal tubule. As pointed out by Walker and his co-workers, this is the reverse of the situation demonstrated in amphibians and it supports the suggestion of Smith that "in the mammal a great part of the water might be reabsorbed in the proximal tubule."⁴ While fluid reabsorption in the mammalian tubule is accomplished without any increase in the osmotic pressure of the fluid remaining within the tubule, it is not by any means a purely passive reabsorption of unchanged glomerular filtrate. Proximal tubular fluid possesses a distinctly higher percentage of chloride than does plasma. The ratio of the chloride concentration in the former fluid to that in plasma appears to reach an average of 1.4 in the first third of the proximal tubule and to remain at that point without further increase throughout the second third of this segment. These observations are apparently indicative of preferential reabsorption of another ion, presumably bicarbonate, in the proximal tubule. On the other hand, since most of the bladder urine specimens in the experiments were found to be hypotonic to plasma with respect to chloride, some further portion of the nephron must reverse the concentration ratio of the proximal segment and preferentially reabsorb the chloride ion.

The recent work of Walker and his associates on the collection and quantitative analysis of glomerular and tubular fluid from mammalian kidneys forms a logical extension of the work initiated by Richards and his co-workers on amphibians. The continued prosecution of these studies will serve further to elucidate problems associated with renal function.

3. Walker, A. M., and Oliver, J.: Methods for the Collection of Fluid from Single Glomeruli and Tubules of the Mammalian Kidney, *Am. J. Physiol.* **134**: 562 (Oct.) 1941. Walker, A. M.; Bott, P. A.; Oliver, J., and MacDowell, M. C.: The Collection and Analysis of Fluid from Single Nephrons of the Mammalian Kidney, *ibid.* **134**: 580 (Oct.) 1941.
4. Smith, H. W.: *The Physiology of the Kidney*, New York, Oxford University Press, 1937. p. 232.

Current Comment

HEALTH ACHIEVEMENTS IN WISCONSIN

Various state medical societies have been undertaking the education of the lay public in health from different approaches. In previous issues of *THE JOURNAL* reference has been made to the program of the California Medical Association¹ and the programs of the medical societies of New York² and Georgia.³ In Wisconsin the approach has been emphasis on the health achievements within the state. The Wisconsin State Board of Health has long been advertising Wisconsin as the third healthiest state in the United States on the basis of ratings by the National Resources Board. The state medical society has made this rating the keynote of a pamphlet⁴ prepared with the cooperation of the state board of health and the state industrial commission. In this pamphlet, illustrated with pictorial statistics, photographs, vignettes and montages, are set forth health achievements in the state such as favorable rates of time lost from industrial jobs, addition of nineteen years to the average life expectancy at birth, over 99 per cent of babies delivered by physicians, low infant and maternal death rates, decline of communicable diseases, availability of hospital facilities, virtual conquest of typhoid, inspections of barber shops, beauty parlors, tourist cabin and summer resort inspections, and industrial and community sanitation. Medical education, postgraduate education and nursing education are dealt with in another section, as is registration of births and deaths. The third section of the booklet deals with unsolved problems in communicable disease control, accident prevention, community and industrial sanitation, heart, cancer, cerebral hemorrhage and nephritis. Emphasis is placed on the availability of physicians, who are at least as easily available as other necessary community facilities, except in three areas all of which are so sparsely populated that no physician could make a living there and even subsidies from local funds are but "a theoretical solution." The pamphlet closes with brief descriptions of eleven cooperative projects of the State Medical Society of Wisconsin with state and public agencies. Going a step further, a film strip has been developed consisting of one hundred frames, which sets forth the same general facts as those in the brochure and under the same title. Accompanying this film strip is an outline for an accompanying lecture.⁴ This film strip is to be made available throughout the state for presentation by county medical societies or under their auspices to lay audiences. More and more the diversity of approach to lay health education by medical societies in various states and counties demonstrates original methods and emphasizes again the importance of free and uninhibited enterprise in an independent medical profession.

1. Doctors on the Air, Current Comment, *J. A. M. A.* **116**: 1648 (April 12) 1941.

2. State Society Purchases Sound Movie Equipment, Current Comment, *J. A. M. A.* **117**: 39 (July 5) 1941.

3. Health Achievements in Wisconsin, prepared by State Medical Society of Wisconsin, Madison, 1941.

4. Health Achievements in Wisconsin, prepared by Committee on Health and Public Instruction, State Medical Society of Wisconsin, Madison.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS, VETERINARIANS

At a meeting in Chicago of the board of the Procurement and Assignment Service with the Committees on Medical Preparedness of the American Medical Association, the American Dental Association and the American Veterinary Medical Association, a definite organization was completed for the functioning of this service in relationship to needs of professional personnel in the war.

PHYSICAL REQUIREMENTS FOR PHYSICIANS IN SERVICE

The Procurement and Assignment Service will make available shortly through publication in the periodicals of the professions concerned a tabulation of the physical requirements for physicians applying to any of the federal services.

EVALUATION OF PHYSICIANS THROUGH COUNTY MEDICAL SOCIETIES

More than two thousand county medical societies have already made available ratings of physicians available in such counties as regards their employment in essential services and their availability for the Army and Navy Medical services. Steps will be taken to speed up the completion of similar evaluations in the remaining counties.

QUESTIONNAIRE

Approval was given to the immediate publication in the professional periodicals of a questionnaire addressed to all members of the medical profession urging them to enroll at once with the Procurement and Assignment Service so as to make available immediately a pool of physicians from whom applicants for commissions might be drawn promptly. The immediate needs of the Army are for men in the grades of lieutenant and captain—that is to say, men particularly under the age of 45.

THE NATIONAL ROSTER

A conference was held with representatives of the National Roster, which is a subsidiary of the National Resources Planning Board. Arrangements were made for joint action with the Budget Committee in Washington to secure the necessary funds for operation of the National Roster covering the medical profession and for the regional office in the headquarters of the American Medical Association.

CORPS AREAS

Dr. James A. Paullin described the methods by which evaluation has been made of all men in the Fourth Corps Area and also the method by which ratings have been given to specialists.

Approval was given to the constitution of committees in each of the corps areas and associated naval districts to function as advisory to the corps area commander, the committee to consist of a chairman who will be the corps area representative of the Committee on Medical

Preparedness of the American Medical Association, one physician representing medical education, one representing the hospital organizations, two physicians selected at large, two dentists and one representative of the veterinary profession. The chairmen nominated for the various corps areas are as follows:

- First—DR. W. G. PHIPPEN, Salem, Mass.
- Second—DR. A. W. BOOTH, Elmira, N. Y.
- Third—DR. A. M. SHIPLEY, Baltimore.
- Fourth—DR. EDGAR GREENE, Atlanta, Ga.
- Fifth—DR. E. L. HENDERSON, Louisville, Ky.
- Sixth—DR. CHARLES H. PHIFER, Chicago.
- Seventh—DR. ROY W. FOUTS, Omaha.
- Eighth—DR. SAM E. THOMPSON, Kerrville, Texas.
- Ninth—DR. CHARLES A. DUKES, Oakland, Calif.

Other physicians nominated to these corps area boards include:

- First—DR. DEERING G. SMITH, Nashua, N. H.; DR. LUCIUS KINGMAN, Providence, R. I.
- Second—DR. S. J. KOPETZKY, New York; DR. W. J. CARINGTON, Atlantic City, N. J.
- Third—DR. C. H. HENNINGER, Pittsburgh; DR. HUGH H. TROUT, Roanoke, Va.
- Fourth—DR. ALFRED A. WALKER, Birmingham, Ala.; DR. EDWARD H. JELKS, Jacksonville, Fla.
- Fifth—DR. ROBERT CONARD, Wilmington, Ohio; DR. LARUE CARTER, Indianapolis.
- Sixth—DR. J. MILTON ROBB, Detroit; DR. STEPHEN E. GAVIN, Fond du Lac, Wis.
- Seventh—DR. F. L. LOVELAND, Topeka, Kan.; DR. ROBERT L. PARKER, Des Moines, Iowa.
- Eighth—DR. HOLMAN TAYLOR, Fort Worth, Texas; DR. JOHN W. AMESSE, Denver.
- Ninth—DR. JOHN FITZGIBBON, Portland, Ore.; DR. JOHN H. O'SHEA, Spokane, Wash.

A regional office is to be established in each corps area for the maintenance of information, for supervision of the state committees and to act as a consulting body on all matters relating to the functions of the Procurement and Assignment Service in the corps area. The following dentists were recommended for appointment:

- First—DR. PHILIP ADAMS, Boston; DR. FRANK W. ROUNDS, Boston.
- Second—DR. WILLIAM MCG. BURNS, Brooklyn; DR. ALLAN T. NEWMAN, New York.
- Third—DR. LUCIAN BRUN, Baltimore; DR. HARRY BEAR, Richmond, Va.
- Fourth—DR. CLAUDE R. WOOD, Knoxville, Tenn.; DR. RALPH R. BYRNES, Atlanta, Ga.
- Fifth—DR. EARL LOWERY, Columbus, Ohio; DR. WENDELL POSTLE, Columbus, Ohio.
- Sixth—DR. LEO KREMER, Chicago; DR. PAUL H. JESERICH, Ann Arbor Mich.
- Seventh—DR. F. A. PIERSON, Omaha; DR. A. W. BRYAN, Iowa City.
- Eighth—DR. H. G. DUCKWORTH, San Antonio, Texas; DR. FRED C. ELLIOTT, Houston, Texas.

Ninth—DR. B. C. KINGSBURY, San Francisco; DR. E. G. SLOMAN, San Francisco.

The following veterinarians were recommended for appointment:

First—DR. R. W. SMITH, Concord, N. H.
Second—DR. R. R. BIRCH, Ithaca, N. Y.
Third—DR. MARK WELSH, College Park, Md.
Fourth—DR. B. T. SIMMS, Auburn, Ala.
Fifth—DR. A. F. SCHALK, Columbus, Ohio.
Sixth—DR. WARD GILTNER, East Lansing, Mich.

Seventh—DR. H. D. BERGMAN, Ames, Iowa.

Eighth—DR. M. B. STARNES, Dallas, Texas.

Ninth—DR. C. M. HARING, Berkeley, Calif.

The names of the physicians representing medical education and those of the hospital organizations will be published later.

The technic was also described for supplying the names of physicians to appropriate governmental agencies according to the present methods of functioning of the Procurement and Assignment Service.

UNITED STATES CIVIL SERVICE COMMISSION NEEDS PHYSICIANS

The United States Civil Service Commission has issued a table showing the number of medical officers (Associate grade \$3,200 per annum) needed in the immediate future in federal agencies. The positions are those in the civil service, for which the Civil Service Commission has the responsibility of recruiting, rating and maintaining registers of qualified eligibles. The needs are, of course, expected to vary as vacancies are filled or new positions are open. Later statements may be required as changes occur (see civil service announcement No. 130 of 1941). The table shows the following needs:

Veterans' Administration	
Optional Branches:	
Tuberculosis	2
Neuropsychiatry	40
General medicine and surgery	40
Ear, eye, nose and throat	5
Roentgenology	3
Pathology	4
Urology	2
Orthopedics	2
Cardiology	1
Chest	1
	100
U. S. Public Health Service	
Optional Branches:	
General practice	37
Public health (general) or general practice	35
	72
Indian Service	
General practice	32
	32
Panama Canal Service	
General practice	15
Eye, ear, nose and throat	1
Pathology	1
	17
Total	219

* U. S. Children's Bureau..... 10

* Estimated need for calendar year 1942. Salary ranges \$3,200 to \$5,600 per annum. See civil service announcement No. 139 of 1941.

Requirements are:

Education.—Applicants for the Associate grade must have been graduated from a medical school of recognized (class A) standing with the degree of M.D. subsequent to May 1, 1930.

In determining the date of graduation of those physicians who have graduated from one of the medical schools which requires a one-year internship following the medical curriculum before conferring the degree of M.D., the commission, for the

purpose of this examination, will consider as the date of graduation the time when the fourth year curriculum was successfully completed and not the date following the internship.

The applications of graduates from foreign medical schools whose graduates are admitted to the examination of the National Board of Medical Examiners will be accepted.

Experience.—Subsequent to graduation, applicants must have had one year of internship, general rotating or in a special branch.

Age Limit.—Applicants must not have passed their fifty-third birthday on the date of receipt of application. The age limit does not apply to persons granted military preference because of military or naval service except that such applicants must not have reached the retirement age.

Physical Ability.—Applicants must be in sound physical health. Remediable defects or curable disease will not exclude a person from examination, but proof that such defects have been remedied or the disease, if any, cured must be received during the life of the eligible register before persons otherwise qualified may be considered for appointment under civil service rules.

Vision must be at least 20/30 (Snellen) in one eye, glasses permitted. The applications of persons who have uncorrected vision of less than 20/200 (Snellen) in that eye, corrected to meet the foregoing requirement, will be suspended and they will not be eligible for appointment until satisfactory evidence has been presented to the commission showing that there is no disease or defect of the eye other than an error of refraction.

Ordinary conversation must be heard at a distance of at least 15 feet with one ear.

For some of these positions, applicants must be at least 5 feet 4 inches in height. The height requirement will be waived for veterans. Vision without glasses must be at least 20/100 (Snellen) in one eye and 20/70 (Snellen) in the other eye and must be corrected to at least 20/40 (Snellen) in one eye and 20/30 (Snellen) in the other eye. Applicants must be able to distinguish basic or saturated colors (lantern, yarn or other comparable tests). Hearing must be 12 feet, each ear. Both upper and lower extremities must be present in their entirety with the exception of the loss of toes or fingers which will cause no disability in the performance of duties.

A rigid physical examination will be made by a federal medical officer or other duly licensed doctor of medicine before appointment. Persons who are offered appointment must pay their own expenses in reporting for duty. If, on reporting at the place of assignment, they are found ineligible because of physical defects, they cannot be appointed and no part of their expenses for returning home can be borne by the government.

MEDICAL UNITS FOR SAN FRANCISCO

At the request of Angelo J. Rossi, mayor of San Francisco, two medical catastrophe units were shipped to that city on December 15 by the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York. Arrangements are under way to send similar first aid medical and surgical units to hospitals in Maine, Vermont, South Carolina and New York, in response to requests. The new policy of the Medical and Surgical Relief Committee of America is to concentrate

future activities on the furnishing of aid to American hospitals and other organizations where they require it for emergency use.

The Medical and Surgical Relief Committee of America is composed of some three hundred and fifty prominent physicians and surgeons. Its object is to make up shortages in surgical and medical supplies in America and, when necessary, to solicit donations for specific needs.

ORGANIZATION SECTION

OFFICIAL NOTES

THE ATLANTIC CITY SESSION

Special Exhibits on Fractures, Lame Backs, and Home and Hospital Delivery

The Committee on Scientific Exhibit announces that there will be three special exhibits at the Atlantic City session, as follows:

Special Exhibit on Fractures.—Presented by a committee composed of Dr. Kellogg Speed, Chicago, chairman; Dr. Frank D. Dickson, Kansas City, Mo., and Dr. Walter Estell Lee, Philadelphia.

Special Exhibit on Lame Backs.—Presented under the auspices of a committee composed of Dr. Frank R. Ober, Boston, chairman; Dr. Carl E. Badgley, Ann Arbor, Mich.; Dr. J. Archer O'Reilly, St. Louis; Dr. Arthur Steindler, Iowa City, and Dr. Philip D. Wilson, New York.

Special Exhibit on Home and Hospital Delivery.—Presented under the auspices of the Section on Obstetrics and Gynecology by a committee composed of Dr. Charles Edwin Galloway, Evanston, Ill., and Dr. Philip F. Williams, Philadelphia.

DOCTORS AT WORK BROADCASTS

Doctors at Work, the radio broadcast by the American Medical Association and the National Broadcasting Company, will continue uninterrupted through the holiday season.

The broadcasts are on the Red Network of the National Broadcasting Company and we are informed that approximately one hundred stations from coast to coast have signified their intention of taking the program.

The program features a dual theme, medical preparedness and "delay is dangerous." Under the first theme the relationship of doctors to the national emergency will be depicted, while under the second theme various medical situations and health situations in which delay may be disastrous to the patient will be illustrated.

As many as possible of the broadcasts are being relayed by short wave transmitters for rebroadcasting by the British Broadcasting Corporation, according to information received from the National Broadcasting Company.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 6251 has passed the House and Senate, amending the Federal Food, Drug and Cosmetic Act by providing for the certification of batches of drugs composed wholly or partly of insulin, the certification to be under regulations to be promulgated by the Federal Security Administrator.

Bills Introduced.—H. R. 6229, introduced, by request, by Representative Rankin, Mississippi, proposes to provide liberalized benefits for disabled American veterans of the World War and their dependents. This bill provides, among other things, that the Administrator of Veterans' Affairs shall receive and adjudicate claims for World War emergency officers' retirement according to provisions of the Act of May 24, 1928, and where entitlement is established the Administrator is authorized to

grant retirement as provided in that act. The benefits or privileges provided by the pending bill may not be denied because of failure to file claim within the period required by the 1928 act or because the former officer was not, prior to March 20, 1933, granted retirement pay. H. R. 6240, introduced by Representative Gillie, Indiana, provides that there shall be in the Medical Department of the Army, in addition to such assistants to the Surgeon General as are now authorized by law, an assistant with the rank of brigadier general, who shall be an officer of the Veterinary Corps. H. R. 6241, introduced by Representative Rogers, Massachusetts, proposes to authorize such sums as may be necessary to provide additional hospital and outpatient dispensary facilities for persons entitled to hospitalization in Veterans' Administration facilities.

MEDICAL ECONOMIC ABSTRACTS

HEALTH PLAN IN HOUSING PROJECT APPROVED

The comitia minima of the Medical Society of the County of New York has adopted a plan to provide four thousand four hundred tenants of the East River Housing Project, 446 East 104th Street, with the services of physicians at low cost, the New York Times reported, November 14. The plan calls for a two year experiment with voluntary cooperation of residents in East River houses. Twenty-five cents a month would be charged for single persons, 50 cents for a married couple, 75 cents for a couple with one child and \$1 a month for a family of four or more. Subscribers would receive the unlimited services of a general practitioner, one resident physician being assigned for every two hundred and fifty families, or one thousand persons. Subscribers would have a free choice of any resident physician. The resident physicians would be selected by a supervising medical board of prominent physicians who are senior members of the staff of the nearest hospital. Resident practitioners would not accept private patients outside the housing area. The New York Foundation, a private fund, will

assume all overhead expenses and guarantee each physician a minimum income of \$1,500, but resident physicians caring for the full quota of two hundred and fifty families, or one thousand persons, would earn \$3,000 a year. A board, consisting of two senior members of the medical board of a neighborhood hospital and two physicians appointed by the county medical society, would act in a supervising capacity and the project would be governed by the East River Medical Council, consisting of four members of the supervising medical board and two representatives of the tenants' association. Persons with catastrophic illnesses would not be taken care of by the plan but would continue to be referred to the wards of the local hospitals. Maternity care would be provided in hospitals as before, but antepartum and postpartum care would be provided by the resident physicians. To make physicians eligible to reside in a low cost housing project, the United States and city housing authorities would authorize one physician to reside on the project for every two hundred and fifty families. The project is similar to the plan placed in operation in 1940 for the tenants of the Vladeck Houses in the Corlears Hook section of New York City by the Medical Society of the County of New York.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 2283.

CALIFORNIA

Annual Surgical Meeting.—The Los Angeles Surgical Society held its twenty-fifth annual meeting, December 13. The guest speakers were Drs. Dallas B. Phemister, Chicago, and Stuart W. Harrington, Rochester, Minn. Dr. Phemister spoke on "Massive Resection and Transplantation for Selected Cases of Bone Sarcoma" and "Interruption of the Circulation of Bone and Its Surgical Significance" and Dr. Harrington discussed "Diagnosis and Surgical Treatment of Carcinoma of the Breast" and "Diagnosis and Surgical Treatment of Constrictive Pericarditis." Dr. James F. Percy, Los Angeles, was among the many local physicians on the program, speaking on "Surgery of Advanced Cancer of the Cavities of the Skull."

Annual Graduate Assembly.—The eighth annual postgraduate assembly of the Alumni Association of the College of Medical Evangelists was held at the White Memorial Hospital, Los Angeles, December 7. The speakers were:

- Dr. Harold L. Thompson, Los Angeles, Gastroscopy.
- Dr. Paul M. Hamilton, San Marino, Recent Advances in the Therapy of Communicable Diseases.
- Dr. Thomas Addis, San Francisco, Diagnosis and Treatment of Nephritis in Group Practice.
- Dr. Maximilian E. Obermayer, Los Angeles, Treatment of Pruritus.
- Dr. Charles P. L. Mathe, San Francisco, Urinary Calculi—Management by the General Practitioner.
- Dr. Erle Henriksen, Los Angeles, Sterility.
- Dr. Robert A. Scarborough, San Francisco, Carcinoma of the Rectum.
- Dr. Ben K. Parks, Long Beach, Otitis Media Complications Even with Chemotherapy.
- Dr. Roy E. Thomas, Los Angeles, Atypical Pneumonia.
- Dr. Douglas G. Campbell, San Francisco, Neurotic Personalities in General Practice.
- Dr. Hans Lissner, San Francisco, Indications for and Modes of Administering Testosterone Compounds in the Male.
- Dr. Rodney F. Atsatt, Santa Barbara, Physical Therapy in Care of Fractures.
- Dr. Leo Eloesser, San Francisco, Compound Fractures in War Time.
- Dr. Joseph Brennemann, Los Angeles, Clinical Significance of Abdominal Pain in Children.
- Dr. Walter A. Bayley, Los Angeles, Diagnosis and Treatment of Acute Intestinal Obstruction.
- Dr. Rupert B. Raney, Los Angeles, Surgical Treatment of Intestinal Obstruction.
- Dr. Percival A. Gray Jr., Santa Barbara, Office Management of the Diabetic Patient.
- Dr. William A. Boyce, Los Angeles, The Cross-Eyed Child's Problem.

ILLINOIS

Public Health Advisers.—The governor recently appointed the following to the board of public health advisers in the state department of health: Drs. Walter D. Stevenson, Quincy, Raymond W. McNealy, James H. Hutton and Robert S. Berghoff, chairman, all of Chicago. Dr. Clifford U. Collins, Peoria, was reappointed to the board, which serves in an advisory capacity to the state director of public health.

Chicago

New Koch Laboratory at Armour Laboratories.—Fred C. Koch, Ph.D., Frank P. Hixon distinguished service professor emeritus of biochemistry and recently retired as chairman of the department of biochemistry at the University of Chicago, will continue his researches in the field of endocrines at the Armour Laboratories, it is announced. A newly completed laboratory has been designated the F. C. Koch Laboratory and set up for his use in the chemical research department of the Armour Laboratories.

Research Fellowships at Illinois.—The Graduate School of the University of Illinois has established four research fellowships to be awarded for one year in medicine and dentistry at a stipend of \$1,200 per calendar year, with one month's vacation. Fellows are eligible for reappointment in competition with new applicants. Candidates must have completed a training of not less than eight years beyond high school graduation. Candidates should indicate the field of research in which they are interested and submit complete transcripts of their scholastic credits, together with the names of three former science teachers

as references. The fellowship year begins on September 1. Application blanks may be secured from the Secretary of the Committee on Graduate Work in Medicine, 1853 West Polk Street.

INDIANA

Malaria Control Program.—The state board of health is carrying out a malaria control program in defense industries located in widely separated areas with the assistance of a \$90,000 appropriation by the WPA. The work is now in operation at Fort Benjamin Harrison, the Kingsbury Ordnance Works, near LaPorte, the Jeffersonville United States Quartermaster Depot, the Indiana Ordnance Works and Hoosier Ordnance Plant at Charlestown, the Jefferson Proving Ground near Madison and the army air base near Fort Wayne. In 1938 more than 1,000 cases of malaria were reported at Terre Haute, and in 1939 an outbreak occurred in a lumber camp in Lake County.

IOWA

Outbreak of Undulant Fever.—Up to November 13, sixty-three persons in Marcus, Cherokee County, had been found with positive reactions for brucellosis following an investigation of an outbreak in September involving thirteen persons. In the initial outbreak all the patients gave the history of using dairy products from a producer who distributed raw milk. Agglutination tests on dairy cows led to the discovery of three reactors and one suspicious reactor. The porcine strain of organism, *Brucella suis*, was isolated from milk specimens taken from two reactors. Blood cultures from some of the patients with undulant fever yielded the same organism. New cases subsequently reported were verified by positive agglutination reactions, and in addition twelve persons were found to have positive reactions in diagnostic dilution during a special survey among school children in public and parochial schools. Marcus has a population of 1,206.

LOUISIANA

Industrial Hygiene Section.—The Louisiana State Department of Health will establish an industrial hygiene section in its division of preventive medicine, beginning the first of the year. The U. S. Public Health Service will lend the new section personnel and equipment, according to *Industrial Hygiene*.

The Chaillé Oration.—The sixteenth annual oration in memory of Dr. Stanford Emerson Chaillé was delivered before the Orleans Parish Medical Society, New Orleans, December 2, by Dr. Roy R. Kracke, professor of pathology and bacteriology and chairman of the department, Emory University School of Medicine, Atlanta. His subject was the dangers of self medication with particular reference to analgesic drugs and their effect on the cellular constituents of the blood.

MARYLAND

Physical Examinations of the School Child.—Children entering kindergarten and the first grade of school in the Eastern Health District of the Baltimore health department are being given physical examinations this year in accordance with a new plan. School number 27 was selected for the experimental project, with the examinations being made by the family physician. New pupils whose families have no private physician or who cannot afford one will receive a complete examination by the school physician. Efforts are made to have the parents present during the examination. Pupils selected for reexamination will be those who show physical defects or health problems. The city health department reported in November that almost one half of the new pupils had been taken to family physicians who, in turn, had submitted forty-two reports on their examinations.

MASSACHUSETTS

Personal.—The Louis E. Kirstein Fellowship at Harvard Medical School, Boston, was recently awarded to Dr. Sidney Cohen, assistant in medicine at the school. Dr. Cohen graduated at Harvard in 1937.

Society News.—Dr. Nathan Finkelstein, Pittsfield, discussed "Renal Tuberculosis" before the Northern Berkshire Medical Society, November 6.—Dr. Augustus Thorndike Jr., Boston, discussed "Effects of Physical Therapy on Athletic Injuries" before the New England Society of Physical Medicine in Boston, October 22.—A special meeting of the Boston Health League was addressed, December 5, by Dr. Harold C. Stuart on "Nutrition in Occupied France."—Dr. Henry E. Sigerist, Baltimore, discussed "The Practice of Medicine in Historical Perspective" before the Greater Boston Medical Society,

December 2.—The Worcester District Medical Society was addressed, December 10, in Worcester, among others, by Drs. Edmund J. Croce, Worcester, on "Prothrombin Deficiency in Hemorrhage" and Edward Budnitz, Worcester, "Prophylactic Use of Sulfapyridine in Patients Susceptible to Subacute Bacterial Endocarditis Following Dental Surgery." Dr. Arthur H. Ruggles, Providence, R. I., discussed "The Problem Child of the 'Teen' Age" for the society in November.

MICHIGAN

The Max Ballin Lectures.—The Dr. Max Ballin Lectures, sponsored by the North End Clinic, Detroit, were delivered, November 26, by Drs. Mandred W. Comfort, Rochester, Minn., on "Disturbances of Physiologic Function in Pancreatitis and Their Recognition," and Robert Elman, associate professor of clinical surgery, Washington University School of Medicine, St. Louis, on "Surgical Aspects of Acute Pancreatitis."

Hospital Day.—Woman's Hospital, Detroit, observed "hospital day," December 3, with a special program: Drs. Charles F. McKhann, Ann Arbor, spoke on "Antenatal and Postnatal Influences on Physical and Mental Development of Infants"; Norman R. Kretzschmar, Ann Arbor, "Intrauterine Oxygenic Exchange"; Willis D. Gatch, Indianapolis, "So-Called Toxemias of Burns, Peritonitis and Bowel Obstruction," and William A. Scott, Toronto, some of the difficulties of gynecologic diagnosis. Preston W. Slosson, Ph.D., Ann Arbor, gave a talk at the banquet entitled "Europe's Extremity as America's Opportunity."

Society News.—Drs. Charles M. Henry addressed the Detroit Physiological Society, Detroit, November 13, on "Peritoneal Fluid in Peptic Ulcers"; Samuel J. Levin, "Absorption of Injected and Orally Administered Pollens," and Robert W. Bates, Ph.D., Difco Laboratories, "Recent Studies on the Pituitary and Growth in Dwarfed Mice." All are from Detroit. —William R. Davis, D.D.S., director of the bureau of public health dentistry of the state department of health, Lansing, was installed as president of the Michigan Public Health Association at its meeting, November 13. He is the first dentist to hold this office. Emilie G. Sargent, R.N., director of the Detroit Visiting Nurse Association, was chosen president-elect.

MINNESOTA

Mayo Memorial Shrine.—A bronze statue of the late Drs. William J. and Charles H. Mayo in their surgical gowns will be the central point of interest of the Mayo Memorial Shrine to be erected in Rochester by residents of the city and Olmsted County, *Minnesota Medicine* announces. It will be placed on a granite base before a granite background in the central open space of an amphitheater, symbolic of operating rooms, it was stated. The shrine, designed by James Earle Fraser, New York sculptor, will be separate from that being planned by the Minnesota Memorial Commission. This commission was appointed by Governor Stassen late in 1940 to study the establishment of a \$250,000 fund for a memorial to the Mayos. State Senator William B. Richardson, Rochester, is chairman of the commission, which is composed of seventeen representative citizens of Minnesota.

NEW JERSEY

Society News.—Dr. Martha M. Eliot, associate chief, U. S. Children's Bureau, Washington, D. C., discussed "Child Health in the Defense Program" before the Essex County Medical Society, Newark, November 13.—Dr. Lewis K. Ferguson, Philadelphia, addressed the Camden County Medical Society, Camden, on "Surgical Therapy in Lesions of the Large Bowel," December 2.

NEW YORK

Anthrax Among Mink—One Human Fatality.—The state department of health reports that 163 of 516 mink maintained on a farm were found dead on September 22. Pathologic and bacteriologic findings, reported by the State Veterinary College, Cornell University, Ithaca, showed that the animals had died of anthrax. The mink were owned by three persons and maintained in three separate units on the same premises. Since September 22 no mink have died and, according to their owners, none have been ill, *Health News* states. The district health officer followed up through local health officers all men who had handled the mink. One man who had skinned 100 of the animals was found on October 2 to have an anthrax lesion on his left middle finger below the nail. Antianthrax serum was administered, but the man died. All the carcasses of the animals were disposed of under the supervision of the state

department of agriculture and markets. Only two of the pelts had been sold. These had been sent to a company in a city elsewhere in the state and were located there through the district health officer.

Instruction in Dermatology.—The Medical Society of the State of New York announces a course on dermatology, arranged by Dr. George M. Mackee, New York, for the Montgomery County Medical Society in Amsterdam. The lecturers, all of New York, are:

- Dr. Frances Pascher, Brooklyn, Modern Conception of Allergy: Its Relation to Allergy, January 6.
- Dr. Laird S. Van Dyck, Diagnosis and Treatment of Common Skin Diseases (exclusive of eczema, drug eruptions, cancer and syphilis), January 13.
- Dr. Royal M. Montgomery, Modern Conception of Eczema with Special Reference to Dermatophytosis, January 20.
- Dr. Elias W. Abramowitz, Drug Eruptions, January 27.
- Dr. John Frank Fraser, Diagnosis and Treatment of Cutaneous Cancer and Precancerous Lesions, February 3.
- Dr. Anthony C. Cipollaro, Cutaneous Tuberculosis and Allied Conditions, February 10.
- Dr. Girsch D. Astrachan, Diagnosis, Cutaneous Manifestations and Clinical Course of Syphilis, February 17.

A monthly series of lectures opened October 23 with a talk by Dr. Alexander A. Weech on "Deficiency Diseases." Dr. Gaylord W. Graves spoke, November 24, on "Preventive Pediatrics and the Periodic Health Examination" and Dr. Charles L. Wood, "Blood Dyscrasias in Infancy and Childhood from the General Practitioner's Viewpoint," December 22. Dr. Katharine G. Dodge will discuss "Rheumatic Fever, Chorea and Heart Disease," January 26; Dr. Harry Bakwin, "Diarrheal Diseases, Acute and Chronic," February 23, and Dr. Philip M. Stimson, "Recent Developments in Communicable Diseases," March 23. This series is a cooperative effort between the state medical society and the state department of health. All the speakers are of New York.

New York City

Care of Aged Physicians.—At the annual session of the state medical society in April, the house of delegates voted to allow voluntary dollar contributions to the Physicians' Home to be added to payments of dues, to assist in the care of aged and infirm physicians. On November 29 the home had received about \$5,000 from this source, it is reported. The Physicians' Home was founded in 1918 and reincorporated in 1936.

New County Bulletin.—The Medical Society of the County of New York plans to publish its own bulletin beginning the first of the year. At that time the *New York Medical Week*, heretofore published by the New York Medical Week, Inc., will cease to act as the official publication of the county society. The new publication will be known as the *Journal of the Medical Society of the County of New York*. The advertising manager's office will be located at 230 West Forty-First Street. All other communications should be sent to the journal at 2 East 103d Street.

Study of Pneumonia Extended.—With the opening on December 1 of a seven months study to include the general experience of physicians in New York County, the city department of health announces an extension of its investigation of pneumonia. Heretofore most of the data available for study have come from hospital records. In the current survey private practitioners have been asked to send in monthly reports, on forms furnished by the department of health, on all the pneumonia cases they treat. Information requested includes complete diagnosis, name of therapeutic agent, dosage and outcome, according to the *New York Medical Week*. The survey, available through Social Security funds, will be under the direction of Dr. Wheelan D. Sutliff, assistant director of the bureau of laboratories division of pneumonia control, city department of health.

New Cancer Hospital.—Ground breaking ceremonies took place, October 27, for the new Nightingale Hospital at 163d Street and Fort Washington Avenue, on land donated to the city by Presbyterian Hospital. The new three hundred and fifteen bed hospital will be devoted to the care and treatment of patients with cancer, to research into causes and methods of therapy and to the education of physicians, medical students and others in every phase of this disease. Columbia University College of Physicians and Surgeons will nominate members of the professional staff of Nightingale Hospital except such appointments as are made under the rules of the Municipal Civil Service Commission. The new hospital will replace the old New York City Cancer Institute Hospital on Welfare Island and the Cancer Clinic at 124 East Fifty-Ninth Street. It is expected that the hospital will be completed in March 1943 at a cost approximating \$2,650,000.

NORTH CAROLINA

Electron Microscope Installed in Research Laboratories.—An electron microscope has been installed and put into operation in the laboratories of the division of experimental surgery of Duke University School of Medicine, Durham. This 1,500 pound machine develops 60,000 volts to magnify an object 25,000 to 100,000 times. It was built by RCA in Camden, N. J.

OHIO

Annual Cardiovascular Institute.—The Cincinnati Heart Council and the Academy of Medicine of Cincinnati held their eighth annual cardiovascular institute, November 18. Local physicians participated in the program of demonstrations, lectures and round table discussions. Dr. Homer F. Swift of the Rockefeller Institute for Medical Research, New York, gave the third in the Alfred Friedlander Memorial Lectures series on "The Nature and Etiology of Rheumatic Fever."

Personal.—Dr. Howard C. Stewart, Cleveland, tuberculosis coordinator for Cuyahoga County for three years and director of the county tuberculosis dispensary since it opened in July 1940, has resigned to rejoin the staff of the Tennessee State Department of Health, effective November 1.—Mr. Delmar R. Serafy, formerly executive secretary of the Columbiana County Public Health League and more recently with the National Tuberculosis Association, New York, has been appointed health education secretary for the Alliance Tuberculosis League and the Stark County Tuberculosis and Health Association.—Dr. Irville S. Rian, Massillon, has been appointed medical superintendent of the Ohio State Sanatorium, Mount Vernon, to succeed Dr. Frank C. Anderson, who resigned to enter private practice.

PENNSYLVANIA

Society News.—Dr. Harold T. Brown, Pittsburgh, discussed "Findings in Pulmonary Tuberculosis" before the Fayette County Medical Society in Union, November 6.—Dr. Herbert T. Kelly, Philadelphia, addressed the Cambria County Medical Society in Johnstown, November 13, on "Nutrition as It Applies to the General Diseases."—Dr. Edward J. Stieglitz, Garrett Park, Md., discussed "Problems of Aging" before the Washington County Medical Society in Washington, December 10.

TENNESSEE

Personal.—Dr. Kendall B. Corbin, associate professor of anatomy, histology and embryology at the University of Tennessee College of Medicine, Memphis, has been appointed chief of the division of anatomy, histology and embryology and acting head of the department of anatomy to succeed the late Dr. August H. Wittenborg, who also served as professor of anatomy at the school.

Society News.—Dr. August H. Lancaster, Knoxville, discussed "Congenital Syphilis" before the Knox County Medical Society, December 7. Dr. Henry C. Long, Knoxville, will speak before the society, December 30, on diabetes.—The Shelby County Medical Society devoted its meeting, November 4, to a symposium on the use and abuse of drugs. The speakers were Drs. Arthur P. Richardson, James M. Betha, James M. Brockman, Conley H. Sanford and Neuton S. Stern. All are from Memphis.—Dr. Murray B. Davis addressed the Nashville Academy of Medicine and Davidson County Medical Society in Nashville recently on "Appendicitis in Children."

Changes in Health Officers.—Dr. Derric C. Parmenter, Tupelo, Miss., has succeeded Dr. Thomas L. Harvey as head of the Dyer County health department, Dyersburg.—Dr. Raymond Mel Perry, Pasco, Wash., was recently appointed director of the Sevier County department of health, succeeding Dr. Lamar A. Byers, Sevierville, who is studying at Johns Hopkins University.—Dr. William L. Phillips, Centerville, director of the Hickman County health department, has been named registrar of vital statistics for the county.—Dr. Chester A. Hicks, Cochran, formerly with the Georgia State Department of Health, has been placed in charge of the Carter-Unicoi-Johnson counties health unit, Elizabethton.

TEXAS

In Memory of Dr. Bodansky.—A bronze plaque has been hung in the main building of the University of Texas School of Medicine, Galveston, in memory of the late Dr. Meyer Bodansky, who at the time of his death in June was professor of pathologic chemistry at the university. He had been a member of the faculty since 1919.

State Owned Cancer Hospital.—Recently enacted legislation provides an appropriation of \$500,000 to construct a state cancer hospital. It is expected that the hospital will be at Galveston and operated in conjunction with the University of Texas School of Medicine, with Dr. John W. Spies, dean, in charge. The bill as passed had the endorsement of the state medical association, the state cancer committee, the state medical college, the Women's Field Army of the American Society for the Control of Cancer and the Federation of Women's Clubs.

WASHINGTON

Personal.—Dr. Charles E. Bender, formerly of Fostoria, Ohio, has been made assistant director of the student health service of the University of Washington, Seattle.

Society News.—The King County Medical Society devoted its meeting, November 3, in Seattle to a discussion of anesthesia; speakers were Drs. Dorthie Mae Ness Hopper, William A. Millington, Charles E. MacMahon and Quentin L. Wood. All are from Seattle.—Dr. Edwin A. Nixon, Seattle, discussed "Ligation and Injection Treatment of Varicose Veins" before the Spokane County Medical Society, November 13, in Spokane.

GENERAL

Postgraduate Assembly for Negro Physicians.—The sixth annual postgraduate assembly for Negro physicians will be held at Prairie View State Normal and Industrial College, Prairie View, Texas, March 2-5. The program will include lectures and clinics in tuberculosis, syphilis, heart disease, pediatrics and obstetrics by white and Negro physicians. There will be no registration fee, and any Negro physician licensed to practice medicine in the United States is eligible to attend. The assembly is sponsored by the Texas Tuberculosis Association, the Texas State Department of Health, the Lone Star State Medical, Dental and Pharmaceutical Association, the Prairie View state college, the Hogg Memorial Foundation of the University of Texas and the National Tuberculosis Association.

Foundation Benefits from Will of Founder.—Simon Guggenheim, at one time U. S. Senator from Colorado, who died, November 2, bequeathed the bulk of his estate to the John Simon Guggenheim Memorial Foundation, which he created in 1925 in memory of his son. After certain bequests to persons and institutions have been fulfilled, the foundation receives the residue of the estate and remainder and contingent interest in all the established trusts. The foundation was created to "promote the advancement and diffusion of knowledge and understanding and the appreciation of beauty." Since its establishment it has fostered research in the medical sciences through the award of fellowships. In 1941 a group of twenty fellowships was available for Latin American scholars for study in the United States, nine of which were in medicine and related fields.

Foundation for Eugenic Alleviation of Sterility.—Expanded activities of the National Research Foundation for Eugenic Alleviation of Sterility, Inc., Nesconset, N. Y., have been announced, which include the construction of new quarters, now nearing completion, and the publication of a year book. Lectures delivered during 1941 through the Society for Education in Heredity and Eugenics, under the auspices of the foundation, will be included in the year book. The National Research Foundation for Eugenic Alleviation of Sterility was organized in 1925 and incorporated in 1940. It aims "to reduce sterility in those eugenically sound; to that end to conduct research and to give suitable medical aid, to further education; to publish results and to initiate suitable legislation." Dr. Frances I. Seymour, New York, is medical director of the foundation.

Society News.—Dr. William L. Mann, Corpus Christi, Texas, was chosen president-elect of the Association of Military Surgeons of the United States at its annual meeting, November 1, and Dr. James A. Mattison, Glendora, Calif., was installed as president. Col. James M. Phalen, U. S. Army, retired, Army Medical Museum, Washington, D. C., is the secretary. The next annual session will be held at San Antonio on Nov. 4-7, 1942.—Dr. Harvey F. Garrison, Jackson, Miss., was named president-elect of the Southern Medical Association at the recent annual meeting in St. Louis. The 1942 meeting will be in Richmond, Va.—The American Federation for Clinical Research will hold its annual meeting in Minneapolis, April 20-21, 1942. Dr. Thomas M. Durant, 3401 North Broad Street, Philadelphia, is the secretary.—Dr. Augustus C. Shipp,

Little Rock, was elected president of the Southern Tuberculosis Conference at the recent meeting in Asheville, N C. Bernice Wright, New Orleans, is vice president and J P Kranz, Nashville, Tenn., secretary treasurer.—The annual convention of Phi Lambda Kappa Medical Fraternity will be held in Philadelphia, December 29-January 1, additional details may be obtained from Dr Benjamin B Rittenberg, chairman of the convention committee, 5400 Arlington Street, Philadelphia.

Comparative Cost Estimated in Microfilm Service and Book Lending.—Atherton Seidell, Medicofilm Service, Army Medical Library, has published a report on the comparative costs of loan service and of microfilm copying in libraries. His analysis of the Medicofilm Service showed that in groups of one hundred orders the total expenditure for materials and work at the wage rate of \$1 an hour was \$17.25, or 17½ cents per microfilm. This included the handling of the books, the verification of the film copies and the mailing, but not the time required for keeping the accounts and collecting for the work done. Actual computations of personnel work hours and the time used in the handling of the 13,607 books lent on an annual average for the five year period 1936-1940 showed this cost to be appreciably higher than that of making and sending out microfilm copies. Mr Seidell stated that from the standpoint of the borrower it is evident that those who have not yet become accustomed to using microfilms will object to receiving one instead of the book itself. Others will appreciate being able to keep the microfilm copy. The report states that from the standpoint of library operation, microfilm service has the advantages of permitting the collections to remain intact for their more uninterrupted use as well as reducing wear and tear of the books. A small charge for the microfilms would probably be sufficient to keep the expenses within the allotments for this feature of library service, making it possible for many reference libraries to extend their scope, it was stated. The report also pointed out that the lessened cost of rebinding books due to wear and tear in transit through the mails represents an important factor in estimating savings made by the wide use of microfilm.

Academy of Orthopaedic Surgeons.—The tenth annual convention of the American Academy of Orthopaedic Surgeons will be held at the Chalfonte-Haddon Hall Hotel, Atlantic City, N J, January 11-15. Papers to be presented will include:

Dr Edwin D Weinberg, Baltimore. Two Cases of Late Rupture of the Extensor Pollicis Longus Tendon Following Colles's Fracture

Dr William A Rogers, Boston. Treatment of Fracture and Dislocation of the Cervical Spine

Drs Frederic C Bost and Verne T. Inman, San Francisco. Pathology of Recurrent Dislocation of the Shoulder, Report of Brinkhart's Operative Procedure

Drs William T Green and Sidney Farber, Boston. Eosinophilic or Solitary Granuloma—Is It a New Disease?

Dr Robert L Carroll, Los Angeles. Rate and Amount of Increase in Muscle Strength Following Infantile Paralysis

Dr Mather Cleveland, New York. A Study of Gross and Microscopic Lesions in Tuberculosis of the Spine

Dr William Allan, Charlotte, N C, Prevention of the Hereditary Crippling Diseases

Dr Pedro Toledo Havana, Cuba, What Is Actually the Best Treatment of Acute Osteomyelitis

Drs Philip Lewin and Louis Schemin, Chicago, Experimental Osteomyelitis

Dr Stuart A Thomson, Toronto, Canada, Treatment of Club Feet with Dennis Browne Splints

Dr Jura Farill, Mexico City. Extra-Articular Fixation and Bone Grafting of the Fractures of the Hip—Preliminary Report

Drs Ralph K Ghormley and Markham B Coventry, Rochester, Minn., Surgical Treatment of Painful Hips in Adults

Dr Wallace H Cole, St Paul, Further Report on the Kenny Treatment of Infantile Paralysis

There will be other papers and courses on lame back, roentgen therapy, fractures, arthritis, knee joint vitallium mold arthroplasty, bone metabolism surgery of the hand disability evaluation, foot disabilities, scoliosis bone tumors, peri-arthritis of the shoulder, war surgery, club foot and congenital deformities. A motion picture program will be a feature each day of the meeting.

Encephalitis Research in Yakima Valley.—Mosquitoes have been proved one of the transmitting agents responsible for the spread of encephalitis and encephalomyelitis, the U S Department of Agriculture recently announced in reporting on a study carried on in Yakima Valley of Washington by specialists of the bureau of entomology and plant quarantine, staff members of the University of California Medical School, San Francisco, and Washington state and local health authorities. Nearly 10,000 mosquitoes, flies and other biting insects were collected this season and tested for viruses of the two diseases. The work was conducted in the Yakima Valley because 27 human beings and from 40 to 50 unvaccinated horses had encephalitis in that area during the summer of 1940. The insects were identified, frozen and shipped in solidified carbon

dioxide to the San Francisco laboratory of the University of California, where they were divided into "pools" according to family and species, washed, ground and injected into mice. One pool composed of *Culex tarsalis* mosquitoes produced symptoms of St Louis type encephalitis. Another pool of the same kind of mosquitoes produced the western equine encephalitis. The department of agriculture points out that, while it has been previously demonstrated that mosquitoes can transmit the disease under laboratory conditions, this is the first time that mosquitoes collected in the field have been proved to be carrying the disease virus. The particular species found carrying the virus is widespread in states west of the Mississippi. Further investigation aims to determine whether mosquitoes are the only transmitting agents of the disease in human beings, whether the *Culex tarsalis* mosquito is the only type that transmits the disease, whether mosquitoes must be abundant in order to cause the disease and whether mosquitoes harbor the disease between outbreaks. Successful vaccines for horses have been developed and are widely used but vaccination in human beings is not yet practical, it was stated. More than 3,000 cases of human encephalitis with about 9 per cent fatalities were reported this year by the U S Public Health Service.

CORRECTIONS

Izenstein Instead of Eisenstein.—Dr Louis A Izenstein of Springfield, Mass., writes that his name was misspelled in footnote 16 in THE JOURNAL, November 29, page 1847.

Leprosy in Canton.—In the Current Medical Literature department of THE JOURNAL, December 13, in the abstract "Leprosy in Canton," is the statement "Of the 52,000 inhabitants who came to the attention of the author, 84 (16 per cent) were found to show various symptoms of leprosy." The percentage within the parenthesis should have been 0.16.

Calculation of the Addis Count.—According to Dr Ernest B Zeisler of Chicago, the method of calculating the Addis count given in footnote 3 in the article by Pittinos, Craig and DeSanctis in THE JOURNAL, November 29, page 1855, contains an error. The first term in the numerator of the fraction reads "number of squares counted" instead of "number of casts or cells counted." The denominator reads "volume of area counted", it is obvious that the authors mean "volume counted." Dr Zeisler believes the formula could be amended as follows. Count the number of casts or cells, just as in a leukocyte count, in the four largest squares, namely 4 sq mm, and call this *n*. Then the volume counted is 0.4 sq mm. Now the formula for the total number of casts or cells per cubic centimeter in the twelve hour sample is

$$N = \frac{n \times 12 \text{ hour volume} \times 1,000}{0.4 \times 15/0.5}$$

or, briefly,

$$N = 83\frac{1}{3} \times n \times 12 \text{ hour volume}$$

Government Services

New Facilities for Research in Aviation Medicine

A temporary building is now under construction adjacent to the laboratories of the Division of Industrial Hygiene, National Institute of Health, at Bethesda, Md., to house new facilities for research on problems of aviation medicine, according to *Industrial Hygiene*. This building is intended primarily for a new low pressure, low temperature chamber and accessory refrigerating equipment for the purpose of testing apparatus of all kinds used by aircraft personnel, including such items as oxygen equipment and clothing. The new decompression chamber is expected to provide simultaneous rapid lowering of temperature and pressure to simulate ascent from the ground at atmospheric pressure and 70 F temperature to an altitude pressure equivalent to 45,000 feet and a temperature of -70 F. The rapid change of temperature and pressure obtainable will exceed that encountered in ascent by any modern aircraft. The only other installations of this kind now in operation are said to be at the Banting Institute, Toronto, and the other at Wright Field, Dayton, Ohio. In addition to the work on apparatus and equipment for aircraft personnel, studies are being made on the effects of sudden decompression to low pressures, the effects of anoxia and the influence of altitude exposure on visual function, it was stated.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 8, 1941.

Fitness of Men Examined for the Armed Forces

Medical examination has revealed a high rate of fitness among the men called up for the fighting services; eight out of every ten have been found fit and many more will probably "make the grade" after a few months of army life. A surprisingly high standard has been found in the age group 37 to 40; six out of ten have been found fit. During the past six months one fifth of the men originally placed in grade 3, the lowest category accepted by the services, have been reexamined and found so improved physically as to be posted to fighting units. Formerly they were serving as clerks, orderlies, batmen and store keepers. Instructions have been given that all grade 3 men are to be reexamined after a few months of army life. In grade 2 comparatively few men have been

Physical Standard of British Man Power

Age Group	Classification, Grade	Per Cent
18/19	1	78
	2	9
	3	3.7
20/25	1	72
	2	13
	3	8.6
35	1	52
	2	18
	3	10
36	1	49
	2	18
	3	11
37	1	46
	2	19
	3	12
38	1	44
	2	20
	3	13
39	1	41
	2	20
	3	14
40	1	37
	2	20
	3	15

regraded. This grade is composed of men not quite up to the standard needed for fighting and whose condition does not improve with army training. They are, however, capable of strenuous duties.

The authorities have been agreeably surprised by the high standard of fitness of the older men. It was thought that men in their early thirties would show the effect of poor feeding in childhood during the last war and the sedentary lives they had led, but statistics disprove this. The accompanying table shows in percentages the physical standard of Britain's man power. Actual numbers cannot be given. The Germans claim that their men are far healthier than ours, but the fact is that their examination for army service is not so strict as ours.

Postwar Hospital Planning

The calmness with which the country views the most critical struggle in its history is indicated by postwar planning of many things. In the House of Commons the minister of health has announced that as soon as may be after the war the objective of the government will be to ensure that by means of a comprehensive hospital service appropriate treatment shall be readily available to every person in need of it. At present there are two distinct hospital systems—the voluntary and the municipal hospitals. The former are so called because they are supported by the voluntary gifts of the charitable to provide treatment for the poor. The municipal hospitals have grown out of the

infirmaries provided for the same purpose by the authorities. Though now down to date they do not have the same reputation as the voluntary hospitals, to which the medical schools are attached. At present there is no coordination between the two systems. The minister of health said that it is proposed to lay on the major local authorities the duty of securing, in close cooperation with the voluntary agencies engaged in the same field, the provision of a coordinated service by placing on a more regular footing the partnership between the local authorities and voluntary hospitals. To achieve the best results and to avoid wasteful multiplication of accommodation and equipment it will be necessary to design such a service by reference to areas substantially larger than those of the individual local authorities. To avoid overlapping and uneconomical expenditure, the more highly specialized services at the teaching hospitals and other centers will serve the wider areas, and a proper division will be arranged between hospitals in these areas.

As to the financial aspects of the government's proposals, they intend to maintain the principle that in general patients shall be called on to make a reasonable payment toward the cost, whether through contributory schemes or otherwise. As far as any new burden may be thrown on local authorities in providing or maintaining hospital accommodation or in contributing toward the expenditure of voluntary hospitals, the government will make a contribution. Special arrangements for dealing with the teaching hospitals by way of increased educational grants are in contemplation. In present circumstances the arrangements for hospital services must be determined by war time requirements.

In a debate which followed, labor members demanded the abolition of the voluntary hospitals and the provision of a hospital service for every one by the state. But Sir Francis Fremantle, specialist in public health, said that in the voluntary system they had a wonderful service developed with extraordinary inequalities and deficiencies but also with extraordinary results, which had been the basis of our medical and public health work. Prof. A. V. Hill, physiologist, said that a high standard of humanity prevailed in our hospitals compared with foreign countries such as Germany. Neither *laissez faire* nor bureaucracy in themselves would suffice. It was necessary to find the best possible compromise between the two systems in medicine as in other matters. All concerned should refrain from playing politics and work together for the public good. Whatever form it might take, a universal public health service was necessary as regards both prevention and treatment. The world catastrophe through which we are passing will bring about many changes in this country, but probably only such as would have taken place much more slowly without it. Our hospital system is one of them. We prefer evolution to revolution and progress which conserves the past to destroying it. We can be charged with illogicality, but by our sturdy common sense we manage to secure practical results better than those of more logical peoples.

Red Cross Aid to Russia

A special Aid to Russia Fund has been opened by a committee of the British Red Cross, of which Mrs. Churchill, wife of the prime minister, is chairman. Speaking at a meeting of the fund Lord Iliffe, chairman of the executive committee of the Red Cross, said that we were assisting all our allies to the extent to which circumstances and geography permitted, but the help needed by Russia was on an altogether different scale in keeping with the enormous battle front. For this purpose they would aim at raising \$5,000,000 within a reasonable time. Field Marshal Sir Philip Chetwode said that we had already sent over 140 tons of supplies to Russia and 53 cases of surgical outfits. We were in the closest touch with the American Red Cross in its mission to Russia. Lord Nuffield, the automobile magnate, has subscribed £250,000 to the Red Cross Aid to Russia Fund.

New Official Names for Drugs

One of the effects of the war is that we are producing synthetic drugs which formerly were imported from Germany and we are renaming them. The General Medical Council has issued a further list of approved names for drugs already produced or likely to be produced in this country. Amethocaine hydrochloride is the approved name for decicain, menaphthone for 2-methyl-1,4-naphthoquinone (menadione), perthidine hydrochloride for dolantin, soluble phenytoin for epanutin, eptoin, sodium diphenylhydantoinate, solantoin and soluble dilantin, sulfacetamide for albucid.

RIO DE JANEIRO

(From Our Regular Correspondent)

Nov. 18, 1941.

The Work of the Rockefeller Foundation in Brazil

The twenty-fifth anniversary of the beginning of the work of the International Health Board of the Rockefeller Foundation in Brazil has been enthusiastically commemorated. Besides articles in newspapers and in medical magazines, some medical associations have held special meetings to honor that humanitarian institution. The most brilliant of these meetings was one promoted by the oldest medical association of Brazil, the National Academy of Medicine. Under the chairmanship of Prof. Aloysio de Castro of the University of Rio de Janeiro Medical School the academy held a crowded meeting to honor the Rockefeller Foundation in the person of Dr. Fred L. Soper, its representative in Brazil. The principal speaker was Dr. Afranio Peixoto, professor of hygiene at the university, who reviewed the most salient facts in the services rendered by the foundation especially in the fields of medical education, public health nursing, instruction of sanitarians and the investigation and control of yellow fever, malaria and hookworm disease. Two medical commissions were sent to Brazil early in 1916, the first under Major Gen. William C. Gorgas, to study the yellow fever situation, and the second, composed of Drs. Richard M. Pearce, John A. Ferrel and Bailey K. Ashford, to survey the grounds of medical education, hospitals and dispensaries, public health agencies and sanitary progress. In the same year an effective cooperation began with the Brazilian National Department of Health and with the São Paulo University, growing little by little and leading to the great development resulting in the medical and public health institutions and services now in operation. One lasting result of this cooperation is the University of São Paulo School of Medicine, now housed in a magnificent building of many stories and provided with a faculty of distinguished professors. It is a long work begun with the cooperation of Drs. Samuel T. Darling and Wilson G. Smillie, whose services were an honor to American medical science. Today the São Paulo school is one of the best on the American continent, and its department of hygiene is a leading institute of scientific research in the country. In the field of public health too the cooperation of the Rockefeller Foundation was of the greatest value. The work against hookworm disease begun in 1916 and greatly developed since 1920 has led to the creation of many modern county health units. With the cooperation of the foundation in 1922 the first training school for nurses was founded in Rio de Janeiro, and a Nursing Division was started in the department of health of the city with an able body of ten American public health nurses as supervisors. This led to the creation of a few training schools for nurses in several cities of a large country where the professionally trained nurse was completely unknown before. The nursing service of the department of health of Rio de Janeiro is now an efficient and popular modern agency of health. With the help of the International Health Board of the Rockefeller Foundation, the School of Hygiene and Public Health of the Johns Hopkins University lent the services of two able professors, Drs. Allen W. Freeman

and James A. Doull, to start a course of instruction for sanitarians in the medical school of Rio de Janeiro, and the foundation granted fellowships to many Brazilian public health workers, who went to the United States to study at leading American schools and to visit different public health organizations.

With the support of the Rockefeller Foundation a complete survey of the yellow fever situation developed in the discovery of the jungle form of the disease, the disclosure of sylvatic mosquito vectors other than *Aedes aegypti* (as *Hemagogus capricorni* and *Aedes escapularis*), the invention of the viscero-tome as the leading means of postmortem diagnosis of yellow fever and, through the work of the Rockefeller Institute, the creation of an efficient vaccine, now injected into millions of people, thus protected against the sylvatic yellow fever, as the only practical prophylactic resource. Brazil is also indebted to the Rockefeller Foundation for the help in the fight against *Anopheles gambiae*, the worst vector of malaria, imported into Brazil from the west coast of Africa. Some species of anopheles are more susceptible to infection than others; some anopheles mosquitoes will not bite man at all; others will bite man only when other animals are not available. *Anopheles gambiae* of Africa, which had spread through the states of Rio Grande do Norte and Ceara, entering the great air port of Natal, Brazil, has probably the highest infectibility and the greatest preference for man of all Anophelines. This makes that species the most important vector of malaria in man. The intensive campaign against the gambiae conducted by the malaria service of the Brazilian health department with assistance in funds and personnel from the International Health Board of the Rockefeller Foundation is an outstanding example of "species sanitation." The measures concentrated on were those which would prevent the breeding of gambiae. The eradication of the imported *Anopheles gambiae* is a paramount example of what is possible through the use of modern antimalarial technic, available to the Brazilian health authorities through the invaluable cooperation of the Rockefeller specialists.

Professor Peixoto praised the humanitarian work of the Rockefeller Foundation in Brazil and commended Dr. Soper for his ability to win the friendship of Brazilian physicians, thus insuring once more the unity of the Americas.

Second Brazil-American Congress of Surgery

The second Brazil-American Congress of Surgery is meeting in Rio de Janeiro. The president of the congress is Prof. Benedicto Montenegro of the University of São Paulo, and the secretary general is Prof. Alfredo Monteiro of the University of Rio de Janeiro. The program includes as the main themes (1) the surgery of pain syndromes, (2) burns and (3) amputations from the functional point of view. The principal papers have been contributed by Drs. Jayme Poggi, Motta Maia and Barbosa Vianna of Rio de Janeiro, Drs. Mario Ottobri, A. Correia Netto and Edmundo Vasconcellos of São Paulo, Dr. Julio Dietz of Buenos Aires and Dr. Manuel Riveros of Assunción, Paraguay.

Marriages

JOSEPH MCGUIRE, Dallas, Texas, to Miss Doris C. Nelson of Warm Springs, Ga., in Shreveport, La., November 3.

ARCHIBALD MAXWELL EDINGTON, Camp Borden, Ont., Canada, to Miss Marion Lowry of Ottawa, November 8.

SPRAGUE HEMAN GARDINER, Baltimore, to Miss Mary Sherret Biggers in Toledo, Ohio, October 22.

AUBREY LEIGHTON SPARKS to Miss Thetis Stiles Ashley, both of Warren, Ohio, October 6.

JEROME MORTON SPATZ to Miss Freyda Penner, both of Chicago, November 9.

ELI SILBERSCHNEIN to Miss Moscha G. Weiner, both of Brooklyn, July 14.

Deaths

Robert Dawson Rudolf, Toronto, Ont., Canada; University of Edinburgh Faculty of Medicine, Scotland, 1889; F.R.C.P., London, England, 1910; professor emeritus of therapeutics at the University of Toronto Faculty of Medicine; served with the Canadian Army Medical Corps, with the rank of colonel, during the World War; at one time president and fellow of the American Therapeutic Society and of the Royal Society of Edinburgh; member of the Association of American Physicians; author of a textbook entitled "Medical Treatment of Disease"; aged 76; consulting physician to the Hospital for Sick Children and the Toronto General Hospital, where he died, November 2.

John Broadfoot Rae, New York; University of Glasgow Medical Faculty, Scotland, 1895; at one time professor of diseases of the ear at the New York Post-Graduate Medical School; member of the Medical Society of the State of New York, American Laryngological, Rhinological and Otolological Society and the American Otolological Society, Inc.; fellow of the American College of Surgeons; served during the World War; consulting aural surgeon, Manhattan Eye, Ear, Nose and Throat, Union and Riverside hospitals and Bronx Eye and Ear Infirmary; aged 74; died, November 20, in Douglas, Ariz.

Jesse Wright Downey Jr. ⊕ Baltimore; University of Virginia Department of Medicine, Charlottesville, 1905; professor of otology at the University of Maryland School of Medicine and College of Physicians and Surgeons; member of the American Otolological Society, Inc.; on the staffs of the Baltimore Eye and Ear Hospital, University of Maryland Hospital and the Mercy Hospital; consultant, United States Marine Hospital; aged 59; died, November 18, of hypertensive cardiovascular disease.

Robert Randolph Jones Jr. ⊕ Durham, N. C.; Johns Hopkins University School of Medicine, Baltimore, 1928; assistant professor of surgery, Duke University School of Medicine; fellow of the American College of Surgeons; assistant surgeon, Duke Hospital; director of the Duke Tumor Clinic; director of education of the North Carolina Division of the Women's Field Army for the Control of Cancer; aged 39; was shot and killed by a deranged patient, November 18.

John Bruce Harvie ⊕ Troy, N. Y.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1881; formerly clinical professor of surgery at the Albany (N. Y.) Medical College; fellow of the American College of Surgeons; past president and secretary of the Medical Society of the County of Rensselaer; surgeon, Samaritan and St. Joseph's Maternity hospitals; consulting surgeon, Leonard Hospital; aged 84; died, November 14, of pulmonary edema and arteriosclerosis.

Elmer Marion Hansen ⊕ Lincoln, Neb.; University of Nebraska College of Medicine, Omaha, 1927; member of the Central Association of Obstetricians and Gynecologists; on the staffs of the Lincoln General Hospital and Bryan Memorial Hospital; aged 48; died, November 12, of coronary disease in St. Louis while attending the convention of the Southern Medical Association.

Luther Curtis Ogle, Etowah, Tenn.; Lincoln Memorial University Medical Department, Knoxville, 1913; member of the Tennessee State Medical Association; formerly member of the board of education of Etowah and chairman of the county board of education; aged 52; died, November 9, of injuries received in an automobile accident.

Royall Roller Richardson ⊕ Medical Inspector Commander, United States Navy, retired, Los Angeles; University of Virginia Department of Medicine, Charlottesville, 1899; entered the Navy June 3, 1901; retired March 1, 1935 for incapacity resulting from an incident of the service; aged 66; died, October 18.

William John Mulheran, Syracuse, N. Y.; Syracuse University College of Medicine, 1901; member of the Medical Society of the State of New York; on the staff of St. Mary's Maternity Hospital and Infants Asylum; aged 64; on the staff of St. Joseph's Hospital, where he died, November 7, of coronary thrombosis.

Belle Constant Eskridge, Monrovia, Calif.; Hahnemann Medical College and Hospital, Chicago, 1891; Harvey Medical College, Chicago, 1895; fellow of the American College of Surgeons; aged 82; died, November 9, of complications due to a fractured hip received in a fall.

James Allen Rutledge, Ada, Okla.; University of Louisville (Ky.) Medical Department, 1911; member of the Oklahoma State Medical Association; served during the World War; aged 52; died, November 2, of injuries received in an automobile accident.

John M. Clayland, Brooklyn; Medical College of Ohio, Cincinnati, 1884; member of the Medical Society of the State of New York; aged 81; died, November 23, in the Brooklyn Hospital, of subacute bacterial endocarditis.

Gus Bross Young, Des Moines, Iowa; Drake University College of Medicine, Des Moines, 1904; served during the World War; aged 59; died, November 5, at the Iowa Methodist Hospital of carcinoma of the stomach.

William Mathews, Philadelphia; University of Maryland School of Medicine, Baltimore, 1897; on the staff of St. Christopher's Hospital for Children from 1913 to 1930; aged 76; died, November 1, of arteriosclerosis.

Nathan Sherwood Ferris, Snow Hill, Md.; Georgetown University School of Medicine, Washington, D. C., 1910; served during the World War; aged 54; died, November 10, of carcinoma of the stomach.

Charles W. Murphey, Los Angeles; University of Louisville (Ky.) Medical Department, 1879; Medical College of Indiana, Indianapolis, 1882; aged 84; died, November 6, of cerebral hemorrhage.

Warren Lewis Hulse ⊕ Detroit; Eclectic Medical College, Cincinnati, 1914; on the staffs of the Grace Hospital and the Highland Park Hospital; aged 60; died in November of coronary occlusion.

Emil Joe Pulkrabek ⊕ Flatonia, Texas; Baylor University College of Medicine, Dallas, 1932; aged 38; died, November 3, in the Scott and White Hospital, Temple, of acute monocytic leukemia.

Thomas Jefferson McDaniel, Plymouth, Ill.; Rush Medical College, Chicago, 1886; aged 81; died, November 17, in St. Francis Hospital, Macomb, of bronchopneumonia.

Harry Marr Stoodley, Arlington, Mass.; Tufts College Medical School, Boston, 1904; member of the school committee; aged 63; died, November 5, of coronary occlusion.

Julius Abram Bogart ⊕ Forrest City, Ark.; University of Arkansas School of Medicine, Little Rock, 1902; aged 72; died, November 17, of acute pulmonary edema.

George Francis Spencer, Atlantic City, N. J.; Jefferson Medical College of Philadelphia, 1920; aged 51; died, November 13, of atrophic biliary cirrhosis.

Mortimer Harwood Paine, Hanson, Mass.; Tufts College Medical School, Boston, 1909; aged 65; died, October 1, in Brockton of cerebral hemorrhage.

John B. Griffith, Lewistown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1891; aged 85; died, November 15, of aortic regurgitation.

Edward Windsor Southall, Geneseo, N. Y.; Homeopathic Hospital College, Cleveland, 1879; aged 90; died, November 12, of chronic endocarditis.

Patrick O'Hair, Waverly, Minn.; State University of Iowa College of Medicine, Iowa City, 1880; aged 93; died, November 7, of heart disease.

Howard W. Pownall, Tyrone, Pa.; Jefferson Medical College of Philadelphia, 1879; aged 84; died, November 8, of angina pectoris.

Henry L. Uhler, Marion, Ohio; Jefferson Medical College of Philadelphia, 1883; aged 81; died, November 2, of coronary thrombosis.

Stephen Stevens, Exeter, Pa.; Bennett Medical College, Chicago, 1915; aged 60; died, November 11, of cardiorenal disease.

George Clarendon Shammo, Philadelphia; Baltimore University School of Medicine, 1898; aged 79; died, November 11.

William Clark Stockton, Milwaukee; Jefferson Medical College of Philadelphia, 1901; aged 68; died, October 23.

Herbert Beals, Buffalo; New York Homeopathic Medical College, New York, 1878; aged 86; died, November 18.

William Arthur Mitchner, Wilson, N. C.; Leonard Medical School, Raleigh, 1908; aged 59; died, November 5.

William Bartley Kyle, Athens, Ala.; Medical College of Alabama, Mobile, 1889; aged 78; died in November.

Roy C. Wolcott, Columbus, Ohio; Pulte Medical College, Cincinnati, 1897; aged 68; died, November 8.

Hector Guy, Miami, Fla. (licensed in Quebec in 1901); aged 67; died, November 14.

Bureau of Investigation

SOME MECHANICAL FRAUDS

Government Closes the Mails to Various Schemes

Fraud orders issued by the Post Office Department have frequently been the subject of extensive articles by the Bureau of Investigation in these pages of *THE JOURNAL*. Following are brief abstracts of some Fraud Orders not dealt with previously:

Albert Thurlow Hunt and his "Spine Relaxer."—Hunt, a Los Angeles osteopath, for some time sold through the mails what he called "Dr. Hunt's New Cervical Spine Relaxer." According to the Post Office memorandum on the case, the device was found to be a halter attached to rope pulleys and an overhead cross bar. It was to be suspended from a screw eye at the top of a door and the user, seated below it, placed the broad strap under his chin and fastened the narrow, adjustable strap under the back of the head, using the straight edge of the buckle. He then grasped the free end of the cord above the head, causing a downward pull strong enough to put all the neck tissues on a vigorous stretch. This treatment was sold "for relief of the functional disorders of head, throat and neck, headache, insomnia, hay fever, nasal catarrh, catarrhal deafness, enlarged tonsils, sinus trouble, pyorrhea, eye troubles, goiter, apoplexy, neck, shoulder and arm neuralgia, and many other distressing conditions are benefited by the improved circulation which the Relaxer produces." The government produced expert medical evidence to show that none of these conditions are curable by any one device but require treatment based on their causes and manifestations. Although Hunt sent the Post Office Department a letter attempting to explain his alleged manipulative system of therapy, he neither appeared at the hearing of the case nor sent any one to represent him. His treatment was found to be a fraudulent scheme to obtain money through the mails, and on Jan. 10, 1940 it was accordingly debarred by a fraud order. Apparently Hunt thereafter used other means than the mails of shipping it, as the Food and Drug Administration at Washington announced on Nov. 28, 1940, that Hunt had been fined \$50 for selling his "Relaxer" in interstate commerce with false and misleading claims on the label.

"Dr." T. B. Shrader and his "Ear Pump."—Shrader, a chiropractor, put out his device from Lincoln and Syracuse, Neb. It consisted of a red rubber suction cup with a soft sponge rubber face containing an opening so that the device might be placed over the ear. It was represented to restore or definitely improve the hearing of any deaf person regardless of the cause or duration of his condition or the failure of any other method; to overcome head noises, earache, dry ears and other "ear ailments" and to produce in all cases the same benefits as those claimed in the testimonials quoted in the sales literature. Neither Shrader nor any representative of his appeared at the hearing, at which the government presented an expert medical witness, a member of the staff of the Surgeon General of the United States. He testified that ear disorders may result from various causes on which a device like the Shrader "pump" would have no effect whatever or, if any, an almost negligible one. Its sale was accordingly declared to be a scheme for obtaining money through the mails by means of false and fraudulent pretenses, representations and promises, and it was debarred from the mails by a fraud order issued on Oct. 14, 1940. (Shrader's Ear Pump was declared not acceptable by the Council on Physical Therapy of the American Medical Association, as reported in *THE JOURNAL* April 19, 1941, page 1771.)

Surehold Company's Truss.—"The Surehold Truss" was put out from North Quincy, Mass., and Westbrook and Portland, Me., by the Surehold Company, whose manager was a W. I. Kennedy. He is reported to have said that in 1936 he purchased the business from the estate of the original owner (not named), who had started the enterprise some fifty years before in Westbrook. It was found that neither Kennedy nor any one else connected with the business had any medical training. In addition to the device, the concern sold a nostrum "Rupturine" which was represented to relieve "outward irritation and pain." Although the truss was represented as a "cure" for hernia, an expert medical witness testified that it was not essentially different from, or superior to, other kinds of trusses but a simple spring type device commonly used. The Post Office Department declared the sale of it a fraudulent means of obtaining money through the mails, and a fraud order debarring it was issued on June 28, 1940.

George W. Lowe's Sure Hold.—From Los Angeles one George W. Lowe sold through the mails what he called "Lowe's Sure Hold Appliance." This apparently had no connection with the "Surehold" truss dealt with in another paragraph, although from the government's description the two seemed to be similar. It is not surprising, therefore, that an expert medical witness testified that Lowe's device would not cure a hernia or hold it in place, as represented by Lowe in his use of customers' testimonials. It was even shown that in 1 case Lowe sold his appliance to a person who had definitely stated that he desired it for the cure of a hernia the size of a hen's egg. The business was debarred from the mails as a fraud on Oct. 2, 1940.

Oscillatherm.—This was put out by an A. E. Ovist and an O. L. Durham, an electrician and a chiropractor, respectively, trading as the Oscillatherm Company of Los Angeles, with a distributing branch at South Bend, Ind. They represented through the mails that their device when used as directed would safely, painlessly and effectively correct and overcome disorders of the prostate gland, restore that organ to a normal, healthy condition that would make surgical operations on the prostate

unnecessary, and that it was the "best, safest and most effective" means available to the public for the correction of disorders in its field. The Oscillatherm was found to be an electrically operated mechanism to dilate and heat the rectum and massage the prostate. An expert medical witness for the government testified that a person without medical training would be incompetent to determine just what form of prostatic disorder he had, if any, or how to treat it either with the Oscillatherm or by any other method. The testimony further showed that the Oscillatherm would not effectively correct or overcome prostatitis or other prostatic disorders and that its use would be dangerous in cases in which cancer had already set in in causing the patient to delay scientific treatment. On Feb. 5, 1941, the Post Office Department issued a fraud order against the Oscillatherm Company, J. T. Wharton, manager, and their officers and agents. Thereafter, it appears, Ruth H. Welsh, who was said to manage the South Bend agency, sent out mimeographed form letters to former customers of the Oscillatherm Company informing them that their accounts had been assigned to her. On May 31, 1941 the Post Office extended the original fraud order to cover her name, as R. H. Welsh, on the ground that she was aware of the fraud order against the Oscillatherm Company and was deliberately seeking to circumvent and evade the provisions of it in mailing out the circulars mentioned.

STIPULATIONS

Agreements Between Federal Trade Commission and Promoters of Various Products

The following items are abstracts of stipulations in which promoters of "patent medicines," cosmetics or medical devices have cooperated with the Federal Trade Commission to the extent of agreeing to discontinue certain misrepresentations in their advertising. These stipulations differ from the "Cease and Desist Orders" of the Commission in that such orders definitely direct the discontinuance of misrepresentations. The abstracts that follow are presented primarily to illustrate the effects of the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act on the promotion of such products.

Agnes MacGregor, Inc., Cosmetics.—The Chicago concern that distributes these signed a stipulation with the Federal Trade Commission in February 1941 in which it promised to discontinue the advertising representations that any of the products in question will effectively cleanse enlarged pores, eliminate blackheads, prove a proper treatment for all types of acne, penetrate into the second layer of skin tissue, remove crow's feet, wrinkles or fine lines, nourish the skin, promote the growth of new hair or correct dandruff.

Ambofa Hair Tonic.—This preparation, also known as "Ambofa Cream for Hair," is put out by the Ambofa Products Company, Hastings, Neb. In January 1941 this concern promised the Federal Trade Commission that it would discontinue certain misrepresentations in its advertising of the product. Among these were that it will make hair healthy, restore its natural beauty, color or luster, kill dandruff germs or rid the scalp of dandruff or eczema or prevent hair from falling or fading.

Approved Model Short-Wave Machine.—One Lillian B. Ferentz, trading as Wayne Short Wave Company, Detroit, signed a stipulation regarding this with the Federal Trade Commission in January 1941. In this she agreed to cease representing that her device is a cure or remedy for sciatica, neuritis, lumbago, arthritis, rheumatism or sinus disorders or that it can be used for any purpose, unless it is clearly indicated that it cannot be safely used except under the supervision of a competent physician, and that its use is dangerous in cases of acute inflammatory processes such as nondraining cellulitis, acute arthritis and acute pelvic infection, and under other specified conditions, that the machine produces a "friendly fever" or that a fever can be created by using an electrical short wave machine or that her device is identical with short wave machines used by medical practitioners and hospitals.

Breck Preparations.—These are put out by John H. Breck, Inc., Springfield, Mass., which concern in March 1941 entered into a stipulation with the Federal Trade Commission. In this the company agreed to discontinue certain misrepresentations in the sale of "Breck's Hair Tonic" (designated by the numbers 1A, 1B or 3), "Breck's Lather Oil pH8 Shampoo," "Breck's Special Scalp Cream," "Breck's #1 Hair Cream," "Breck's #2 Hair Cream" and "Breck's Ointment." Among these were that any of the preparations, whether used alone or in combination, differs from other systems of treating hair and scalp troubles or is a competent remedy for eczema of the scalp, psoriasis, alopecia areata, headache, troublesome monthly periods or sick stomach, that any one of them is valuable for adhesions or will bring about a normal condition of the scalp-connective muscles, cause hair to grow, save the old hair, stop or prevent falling hair, atrophy or excessive loss of hair; cause, encourage or quicken the growth of hair, delay its graying, prevent the loss of hair following erysipelas, scarlet fever or other diseases or conditions or aid in restoring the hair in such conditions.

Chasers.—This breath lozenge is put out by Chasers, Inc., of New York. In January 1941 the concern stipulated with the Federal Trade Commission that it would cease advertising its product as "the one effective tablet" which would permanently overcome bad breath due to tobacco, onions, alcohol, garlic, organic derangements, infections and other conditions, do more than temporarily dispel such breath odors or kill or mask all types of unpleasant breath.

Valortone.—This was represented as a herbal treatment that would restore natural luster and loveliness to the hair and achieve results not obtainable from any other preparation. In January 1941 Julius Skinder, Clinton, Ind., operating under the trade names Valortone Herb Company and Lavelle Sales Company, stipulated with the Federal Trade Commission that he would withdraw these advertising misrepresentations and some others, such as that the product would enable users to regain natural color or health of hair or stop dandruff or falling hair.

Correspondence

MARRIAGE IN EPILEPSY AND DIABETES

To the Editor:—In a recent issue of *THE JOURNAL* (October 18, p. 1402) a query regarding the marriage of the epileptic was answered in a manner which I feel demands a protest. The reply ends "At present the only hope of eliminating the disease epilepsy is by birth control among epileptic adults." This reply overlooks two facts: The first is that a person afflicted with epilepsy who marries a normal person may expect one child in forty resulting from the union to suffer from convulsions. The second is that the hope of weeding out a recessive mendelian trait by birth control is so minute as to be negligible.

In interesting contrast is a letter with regard to the marriage of diabetic patients in the next issue (p. 1490). The reply states "If diabetes were to be eliminated by eugenics, not only diabetic patients but all relatives of diabetic patients would have to be sterilized or prevented from marrying." The commentator seems not alarmed to admit that some descendant of the proposed union would be likely to have diabetes. Need one be so alarmed that some descendant of a patient with epilepsy, or of the patient's relatives, will have convulsions? Epilepsy, like diabetes, can now usually be brought under control by proper medication if taken early enough. The medical profession should point the way to a more realistic attitude toward the disease and be willing to examine each case on its individual merits.

TRACY J. PUTNAM, M.D., New York.

SIR WILLIAM WILLCOX

To the Editor:—In *THE JOURNAL* of September 20 your London correspondent reported the death of Sir William Willcox and referred to his skill as a toxicologist, his great experience in forensic medicine, his connection with the Crippen case and his knowledge of chemical pathology, and mentioned his most important writings. He said nothing of his extraordinary and gallant services in the British army in one of its most terrible, fantastic but finally successful campaigns in World War I, that in Mesopotamia, from 1914 until after the official end of the war. The campaign was fought by what was officially the Indian, not the British, army—the Indian army composed of white British and native Indians. It was, of course, a part of the British forces but was really the Indian army, sent from India. The Mesopotamian War was a dreadfully difficult affair, replete with every kind of tragedy.

In the fall of 1914 the British occupied Basra, on the Shatt-al-Arab, the short river at the head of the Persian Gulf, formed by the confluence of the Tigris and the Euphrates. This meant war with Turkey. Conditions were difficult, the climate was atrocious, disease was common and local military actions were many; however, in the summer of 1915 the first advance was made up the Tigris against Baghdad. The army got as far as Ctesiphon but was from there driven back to Kut-el-Amara, where it was caught, besieged and captured. Things were in evil case anyway and made infinitely worse by the high incidence of scurvy and beriberi, which were not brought under control until the arrival of the special army consultants Sir Victor Horsley and Dr. (later Sir) William Willcox. Other diseases were present, heat stroke being the most fatal of all, undoubtedly causing the death of Sir Victor Horsley himself. The value of the work of Sir William during all this trying time cannot be exaggerated.

In 1917, with continued zeal in spite of all possible obstacles, the Indian army advanced a second time and captured Baghdad, where the commanding general, Sir Stanley Maude, shortly afterward died of cholera, which was there endemic. The undoubtedly reason for his death was that he had refused to take the immunizing inoculations against cholera, though he forced all his officers and men to do so; he claimed that a man of his age was immune. A furious controversy arose over his death, the accusation being made that Sir Stanley had been poisoned. Willcox, who had accompanied the troops and attended the general, testified that he was not poisoned; however, it took three months for a special board of inquiry to make up its mind that Sir William was right. Previous to his death General Maude had written of Sir William "I consider his work in improving the health of my forces equal to two divisions [about 30,000 men]. Whatever it costs in work and in money, you must see that the country provides everything that Willcox thinks necessary."

In 1918 more than 50,000 Christian refugees soaked into Mesopotamia from Turkey and Persian Azarbaijan; two thirds were Assyrians and one third Armenians. The Turks and the Kurdish tribes attacked and ravaged them when and where they could. The survivors were finally gathered in a camp on the Diyala River 3 miles from Baquba. The death rate was about 60 a day; typhus fever broke out "but was luckily recognized as such by the ever vigilant Colonel Willcox." To quote from the "Official Medical History:

A large quarantine camp was formed, where all refugees were examined as a preventive measure. Few of the medical officers had seen cases of this fever, and, had the diagnosis not been made by the consulting physician at the time, the disease would probably have spread to the men of the labor corps.

Throughout the whole period of warfare and postwar readjustment a great service was done by the Order of St. John of Jerusalem and the British Red Cross Society, including its Indian branch. In writing of the work of these organizations Colonel Moens mentioned by name only one officer, Colonel William Willcox, "to whose labors the immense and progressive improvement in the health of the troops was so largely due, and by whose never failing help the Red Cross profited beyond all measure."

Throughout those trying years of warfare against men and disease, when death lurked on every side, Sir William carried on steadfastly and courageously while all about him companions died of battle casualties and sickness. The story of the devastating Mesopotamian War is now seldom thought of, but in all the firmament of military medicine the star of Sir William Willcox will shine as brightly as any other.

The notes contained in this letter have been obtained chiefly from the first of two volumes on Mesopotamia: I. "Loyalties—Mesopotamia 1914-1917; II. Mesopotamia 1917-1920: A Clash of Loyalties—A Personal and Historical Record," by Lieut. Col. Sir Arnold Wilson, K.C.I.E., C.S.I., C.M.G., D.S.O., formerly acting civil commissioner in Mesopotamia, political resident in the Persian Gulf, His Majesty's consul-general for Fars, Khuzistan, and so forth (London, Oxford University Press, Humphrey Millford, 1930 and 1931).

It is interesting to note the wide knowledge of this author and cavalry officer, born, brought up and educated in England, transferred to the Indian army and thence to Mesopotamia, who made, in his two fascinating volumes, free use of Latin, Greek, Biblical and other historical quotations. He put at the beginning, alone on one page as an invocation, a poem, "The Band in the Pines," which he found in the *Southern Illustrated News*, printed in 1863 during the U. S. Civil War, referring to the death of General Jeb Stewart's chief of artillery, Major Pelham, a gallant soldier killed at the age of 22.

RICHARD H. MILLER, M.D., Boston.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

CHICAGO, Feb. 16-17, 1942. Council on Medical Education and Hospitals, Sec. Dr. William D. Cutter, 535 North Dearborn Street, Chicago.

MEDICAL CORPS, UNITED STATES NAVY

Examination. Assistant Surgeon with the permanent rank of Lieutenant (junior grade) and Acting Assistant Surgeon with the probationary rank of Lieutenant (junior grade), Jan. 5-9. Examination will be held at the Naval Hospitals at Chelsea, Mass., Newport, R. I., Brooklyn, Philadelphia, Norfolk, Va., Charleston, S. C., Pensacola, Fla., Corpus Christi, Tex., San Diego and Mare Island, Calif., Puget Sound, Wash., Great Lakes, Ill., Pearl Harbor, T. H., and Naval Medical Center, Washington, D. C. Apply Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

BOARDS OF MEDICAL EXAMINERS

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, December 20, page 2191.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS Parts I and II. Various centers, Feb. 9-11. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written, Part I.* Various centers, March 31. Final is Dec. 31. Sec., Dr. Paul M. Wood, 745 Fifth

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral* April in advance of the meeting of the American College of Physicians and June, in advance of the meeting of the American Medical Association. Applications should be on file 6 weeks in advance of the date of oral examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: New York, June. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written, Part I.* Group B. Various centers, Jan. 3. *Oral, Part II* Groups A and B Atlantic City, May or June. Final date for filing application is March 1. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY: *Oral and Written* All Groups Philadelphia, June, preceding the meeting of the American Medical Association. Final date for filing application is March 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha, Neb.

AMERICAN BOARD OF PATHOLOGY: St. Louis, March 30-31. Final date for filing application is Jan. 30. Sec., Dr. F. W. Hartman, Henry Ford Hospital, Detroit.

AMERICAN BOARD OF PEDIATRICS: *Oral*, Cleveland, May 13, preceding the Region III meeting of the American Academy of Pediatrics. *Written*, Locally, February 14. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY: *Oral* All Groups Atlantic City, June 4. Final date for filing application is April 1. Sec., Dr. Byrl R. Kirklin, 102 110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written, Part I* Various centers, March 2. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: *Written*, Various centers, December. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Indiana June Report

The Indiana State Board of Medical Registration and Examination reports the written examination for medical licensure held at Indianapolis, June 17-19, 1941. The examination covered 15 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and twenty candidates were examined, all of whom passed. One physician was licensed to practice medicine on endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists.....	(1941, 2)		2
University of Southern California School of Medicine.....	(1940)		1
George Washington University School of Medicine.....	(1940)		1
Loyola University School of Medicine.....	(1940, 2)		3
Northwestern University Medical School.....	(1941, 3)		3
Rush Medical College.....	(1941)		1
University of Chicago, The School of Medicine.....	(1941)		1
University of Illinois College of Medicine.....	(1941, 2)		2
Indiana University School of Medicine.....	(1940), (1941, 97)		98
University of Louisville School of Medicine.....	(1941, 2)		2
University of Minnesota Medical School.....	(1941)		1
University of Oregon Medical School.....	(1932)		1
Medizinische Fakultät der Universität Wien.....	(1933)		1
Osteopaths*			3

LICENSED BY ENDORSEMENT

School	Year Grad.
Yale University School of Medicine..	(1938)

* Licensed to practice surgery.

Virginia June Report

The Board of Medical Examiners of Virginia reports the written examination for medical licensure held at Richmond, June 17-20, 1941. The examination covered 8 subjects and included 80 questions. An average of 75 per cent was required to pass. One hundred and thirty-eight candidates were examined, 136 of whom passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
George Washington Univ. School of Medicine (1938), (1940)			2
Howard Univ. College of Medicine (1939), (1940, 2), (1941, 3)			6
Tulane University of Louisiana School of Medicine (1941)			1
Cornell University			1
Duke University Sc			1
Jefferson Medical College of P			2
Medical College of Virginia ..			1
University of Virginia Department of Medicine.....			61
Medizinische Fakultät der Universität Wien (1929), (1933), (1934, 2), (1937).....			52
Albert Ludwigs Universität Medizinische Fakultät, Freiburg			5
Friedrich-Wilhelms Universität Medizinische Fakultät, Berlin			1
Georg-August-Universität Medizinische Fakultät, Göttingen			1
Ludwig-Maximilians-Universität Medizinische Fakultät, München			1
Osteopath*			1

School	FAILED	Year Grad.
Deutsche Universität Medizinische Fakultät, Prag.....		(1935)
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1923)

Twenty-seven physicians were licensed to practice medicine by reciprocity and 8 physicians so licensed on endorsement of credentials of the National Board of Medical Examiners from February 13 through June 20. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Birmingham Medical College.....	(1910)		Alabama
George Washington Univ. School of Medicine (1918), (1937)			Dist. Colum.
Georgetown University School of Medicine.....	(1934)		Maryland
Howard University College of Medicine.....	(1937)		Missouri
Emory University School of Medicine.....	(1922), (1932)		Georgia
Loyola University School of Medicine.....	(1927)		Ohio
Rush Medical College.....	(1935)		W. Virginia
University of Louisville School of Medicine. (1938), (1939)			Kentucky
Tulane University of Louisiana School of Medicine.....	(1928)		Mississippi
(1937) Louisiana			
University of Nebraska College of Medicine.....	(1936)		Nebraska
Dartmouth Medical School	(1907)		New Hamp.
Cornell University ..	(1936)		New York
Univ. of Rochester ..	try (1932)		Ohio
Ohio State Universi ..	(1938)		Ohio
University of Oklah ..	(1939)		Oklahoma
Jefferson Medical College of Philadelphia.....	(1925)		Penna.
University of Pennsylvania School of Medicine.....	(1928)		Penna.
(1936) North Carolina			
Medical College of the State of South Carolina.....	(1938)		S. Carolina
Meharry Medical College.....	(1940)		Tennessee
University of Tennessee College of Medicine	(1938)		Tennessee
University of Wisconsin Medical School	(1935)		Wisconsin
Osteopath †			Missouri

LICENSED BY ENDORSEMENT

School	Year Grad.
Yale University School of Medicine.....	(1934), (1936)
Georgetown University School of Medicine.....	(1934), (1936)
Tufts College Medical School.....	(1936)
Columbia University College of Physicians and Surgeons.....	(1929)
Duke University School of Medicine.....	(1935), (1937)

* Examined in surgery.

† Licensed to practice surgery.

Iowa June Report

The Iowa State Board of Medical Examiners reports the written examination for medical licensure held at Iowa City, June 3-5, 1941. The examination covered 8 subjects and included 100 questions. An average of 70 per cent in each subject was required to pass. Sixty-nine candidates were examined, 67 of whom passed and 2 failed. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
Loyola University School of Medicine.....	(1941, 2)		2
State Univ. of Iowa College of Medicine .. (1940), (1941, 57)*			58
State Univ. University School of Medicine.....	(1940)		1
St. Louis University School of Medicine.....	(1940, 2), (1941, 3)*		5
Creighton University School of Medicine.....	(1939)		1

School	FAILED	Year Grad.
State University of Iowa College of Medicine.....		(1941)
University of Toronto Faculty of Medicine.....		(1939)

* Licenses have not been issued.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Governmental Hospital: Liability to Pay Patient.—The Welfare and Institutions Code of California authorizes the board of supervisors of each county to "establish and maintain a county hospital." Pursuant to that authority, the board of supervisors of Siskiyou County maintained a general county hospital in the city of Yreka, Calif. Patients of the hospital who were able to pay were charged for the actual cost of hospitalization; other patients were treated on a full charity or semicharity basis. There were no private general hospitals in Siskiyou County and consequently the county hospital accepted so many full pay patients that it operated at a financial profit. The plaintiff entered this hospital as a full pay patient for the treatment of a minor leg injury. During the course of the treatment, the plaintiff's leg was placed in a bake oven and left in so long that it was seriously burned and had to be amputated. In a subsequent suit against the county, and others, it was contended that the injuries were due to the negligence of certain nurses and doctors employed by the county hospital. The county demurred to the complaint, the trial court sustained the demurrer, and the plaintiff appealed to the district court of appeal, third district, California.

The defendant county contended that it was not liable for the plaintiff's injuries because, in operating the general hospital pursuant to statutory authorization, it was engaged in a governmental function. The plaintiff, however, contended that by making the charges so high that they resulted in the hospital operating at a financial profit, the county had abandoned its governmental function and entered the field of private business and that it was therefore engaged in a proprietary venture and should be liable for negligence to the same extent as a private institution. The district court of appeal said that the purpose of the statute authorizing the operation of county hospitals was to provide for the furnishing of hospitalization and medical care to persons who actually were in need of that care. Furthermore, the court observed, it was customary for county hospitals to accept pay patients so far as their facilities permitted. In Siskiyou County, because of the absence of any other general hospital, all persons requiring hospitalization were unable to get it, regardless of their ability to pay, if they were denied admission to the defendant hospital. Such persons were therefore actually in need of care, said the court, and the county was clearly at liberty to admit them to its hospital. Furthermore, the county had a right to compel each patient to pay as much of the actual cost of hospitalization as he could afford, and the imposition of a charge for services, even though incidentally resulting in a financial profit to the hospital, was not inconsistent with the exercise of a governmental function. *Davie v. Board of Regents*, 66 Cal. App. 693, 227 P. 243 (abstr. J. A. M. A. 84:310 [Jan. 24] 1925). The district court of appeal therefore held that the county, in operating the hospital, was engaged in a governmental function and was not liable for the negligence of its employees. Judgment for the defendant county was accordingly affirmed.—*Calkins v. Newton*, 97 P. (2d) 523 (Calif., 1939).

Workmen's Compensation Acts: Refusal of Employee to Undergo Operation.—The employee injured his right knee and instituted proceedings to obtain compensation under the workmen's compensation act of Louisiana. An award was made, conditioned on the employee's submitting to an operation to correct his disability, to be performed by a surgeon of his own choice. This the employee refused to do and the matter came before the Supreme Court of Louisiana for review.

According to the record in this case, the injury to the employee's right knee consisted of a fractured internal semilunar cartilage which protruded to the medial side of the knee joint, causing a tumor mass or growth at that point. The testimony showed that the operation to relieve this condition would require the opening of the knee joint, making a split in the capsule and

removing the loose or fractured portion of the semilunar cartilage. The employee contended that the lower court erred in holding that his disability could be relieved by a simple, minor and harmless surgical operation unaccompanied by great pain and unattended by serious risk. The employer argued that the refusal of the employee to submit to the tendered operation released the employer from the obligation to continue compensation payments, taking the position that when a simple and harmless operation which will cure the employee's condition is seasonably and duly offered and the employee arbitrarily and unreasonably refuses it, then that tender of the operation released the employer from the obligation of continuing compensation payments. The medical testimony in the case was in conflict as to whether the operation offered was a simple one, unattended by appreciable risk of pain. A physician called by the employer testified that the operation was comparable to an appendectomy or a tonsillectomy; he did not look on it either as a major or as a minor operation. This witness testified that it was little more than a minor operation and a little less than a major operation, something like removing a tumor from the abdomen. Another witness for the employer, an orthopedic surgeon, testified that in the hands of a competent orthopedic surgeon the operation was a simple one. He testified that from 75 to 80 per cent of persons undergoing such an operation recover completely without showing any weakness in the knee as a result of the operative procedure. He estimated the time of recovery from four to eight months and not exceeding one year. Another physician, who "did the medical work" for the employer, testified that the operation was a simple one because it is so common. The employee called only one medical witness, who testified that he would not consider the operation a minor one and seriously doubted whether the employee's knee would be as strong after the operation as it was prior to the injury.

The Supreme Court of Louisiana thought that if the tendered operation was to be regarded in the nature, as to the seriousness thereof, of a tonsillectomy, an appendectomy or an abdominal operation for the removal of a tumor, it certainly could not in the light of the jurisprudence of the state be considered such an operation that the employee's refusal to undergo it would be unreasonable and arbitrary. The court therefore held in effect that the employee was justified in his refusal to submit to the operation and affirmed the award of compensation after eliminating the requirement with respect to the operation.—*Simmons v. Blair*, 194 So. 585 (La., 1940).

Autopsies: Right of Insurance Company to Demand Autopsy After Burial.—The plaintiff insurance company insured the life of the insured under policies which provided, among other things, that in the event of the death of the insured "The Company shall have the right and opportunity to examine the body and to make an autopsy unless prohibited by law." The insured fell down a flight of steps and sustained a multiple fracture of the skull. Death followed within a few minutes. Two days later the decedent's administrator explained the facts surrounding the death to the insurer's agent, informed him that the funeral had been arranged for the afternoon of the following day and suggested that if an autopsy was desired it should be performed before the funeral because the widow would not consent to one after the interment. The agent indicated that an autopsy would not be required and the funeral took place as planned. Two weeks later, the insurance company requested an autopsy; the request was refused and the present suit ensued to establish the right of the insurer to exhumate the body for the purpose of having an autopsy performed. The district court gave judgment for the insurer and the defendants appealed to the U. S. circuit court of appeals, fourth circuit.

The insurer contended that the exact cause of death of the insured was unknown but that there was reason to believe that it was due to the effects of intoxication. Two physicians testifying for the insurer, who had no knowledge of the physical condition of the deceased at the time of the accident and who had never examined him, stated that the insured might have died from coronary occlusion, arterial aneurysm, apoplexy or internal hemorrhage, that the use of alcohol by the insured would increase the likelihood that one of these diseases con-

tributed to his death and that the only way to be sure was by performing an autopsy. The evidence on the question of intoxication showed that the deceased was not inebriated at the time of his fall and that his general habits with respect to the use of intoxicants were "about the same as 90 per cent of the people who visit country clubs." Six physicians testified positively that the cause of death was a cerebral hemorrhage induced by the fracture. One of these, who had examined the insured two or three minutes after the fall and before his death, stated that the conditions present were inconsistent with either a coronary occlusion or an arterial aneurysm.

Some decisions, observed the circuit court of appeals, in construing a provision like that involved in this case have denied the right to an autopsy after burial unless the insurance policy specifically so authorizes, on the ground that "an unnecessary or unreasonable exercise of the right of autopsy entails a course of action that is abhorrent to the sensibilities of surviving relatives and may involve a desecration of the grave." The more modern rule, however, seemed to the court to be to permit an autopsy after burial if (1) it appears that, through no fault of the insurer, it was impracticable to demand and to perform the autopsy before interment and (2) it appears reasonably certain that an examination of the body will reveal something bearing on the rights of the parties which could not otherwise have been discovered.

The district court in this case found that one day only was available to the insurer between the death and the burial and that this was insufficient to permit an investigation. The demand for an autopsy two weeks after the death of the insured was, in the opinion of the lower court, made within a reasonable time. The district court also found that the insurer had reasonable ground to believe that an autopsy might disclose such a contributing cause of death as would relieve it from liability. Opinions may differ, said the circuit court of appeals, as to whether the period which elapsed after the insurer had knowledge of the death gave sufficient time before interment for a decision on the necessity of an autopsy. The appellate court did not consider it necessary to decide this point in view of the fact that the court was of the opinion that the insurer failed to show that it had reasonable ground to believe that death was not purely accidental within the meaning of the policies. All the evidence, the court continued, tended to show that the insured was killed by the fall and there was no evidence whatever to indicate that he was afflicted by any disease at the time of the accident. The insurer had no basis for its assertion, in the opinion of the court, that disease was a contributing cause of the death but only a hope that in the course of the investigation something might be revealed that would relieve it from liability. Under such circumstances, the court thought it would be unreasonable to compel the representatives of the deceased to permit an autopsy, and the judgment of the district court was reversed.—*McCulloch v. Mutual Life Ins. Co. of New York*, 109 F. (2d) 866 (IV. Va., 1940).

Malpractice: Standard of Care and Skill Required of Specialists.—The defendant physicians specialized in diseases of children. On May 25, 1937 a mother, one of the plaintiffs, requested one of the defendants to call at her home to see her 9 month old son. He was unable to go but sent his office associate instead. The boy was found to be suffering from nausea, diarrhea and an inflamed throat. His temperature was 102 F. The condition was diagnosed as a common cold but two days later the boy's condition became much worse, his temperature rose to 104 F. and his breathing became so heavy that it could be heard downstairs. One of the defendants again examined the boy but advised the plaintiffs that their son just needed rest in bed and that hospitalization was not necessary. The next morning, however, the plaintiffs notified the defendants that they were taking their son to the hospital and requested the defendants to meet them there. The child was put immediately into an oxygen tent and subsequently a throat specialist performed an operation on the patient's throat, the nature of which was not disclosed by the record. The patient's condition continued to get worse, however, and he died two days later. Subsequently the plaintiffs, mother and father of the patient, sued the defendant physicians for malpractice. The jury found

for the defendants, the trial court granted a new trial and the defendants appealed to the Supreme Court of Washington.

The trial court instructed the jury that the defendants were required to possess that degree of care and skill usually possessed by specialists engaged in a like practice in the same or similar communities. In other instructions, however, the jury was told that the defendants were to be held only to that degree of care and skill used by physicians generally at the time and in the locality. These instructions were obviously inconsistent. The defendants apparently conceded that a specialist is held to a higher degree of care than a general practitioner, but they contended that such rule applied only to physicians who specialized in the treatment of a particular disease or organ and not to a group specialty, such as pediatrics. The Supreme Court, however, failed to see any reason why physicians who specialize in the treatment of the diseases of children should not be held to the same degree of care that other physicians practicing the same specialty in the same community exercise. Since the instructions to the jury were conflicting, a new trial was proper, the Court said, because it was impossible to determine what effect such inconsistency may have had on the verdict of the jury.

The defendants further contended that the evidence was insufficient to justify the trial court in submitting the case to the jury. Malpractice, said the Supreme Court, need not be established by direct and positive evidence; circumstantial evidence will suffice. In this case there was a clear conflict in the testimony as to what was done. To the defendants' contention that there was no evidence from which the jury could find that the boy would have lived even though he had received prompt treatment, the Supreme Court replied that the plaintiffs were required only to show that the probability that the child would live was greater if he received prompt treatment than if he did not. There was sufficient evidence, in the opinion of the Court, to justify a submission of the case to the jury. The order granting a new trial was therefore affirmed.—*Atkins v. Klein*, 100 P. (2d) 1 (IVash., 1940).

Charitable Hospitals: Liability to Pay Patient.—While the plaintiff, a woman over 70 years of age, was a pay patient in the defendant hospital she fell out of bed and fractured her hip, the fall being attributed to the failure of one of the hospital's nurses to equip the bed with sideboards. The plaintiff subsequently sued the hospital for damages and obtained a judgment in the trial court. On appeal to the district court of appeal, the plaintiff's judgment was affirmed (87 P. (2d) 374; abstr. J. A. M. A. 114:1406 [April 6] 1940) and the defendant appealed to the Supreme Court of California.

The defendant contended that it was a charitable organization, that there was no showing that it had failed to use due care in the selection or retention of its employees and that therefore it was exempt from liability for the torts of those employees. In the opinion of the Supreme Court, however, the more modern, as well as the more logical, view required charitable hospitals to respond in damages for injuries to a paying patient. The judgment for the plaintiff was accordingly affirmed.—*Silva v. Providence Hospital of Oakland*, 97 P. (2d) 798 (Calif., 1939).

Society Proceedings

COMING MEETINGS

Annual Congress on Industrial Health, Chicago, Jan. 12-13. Dr. C. M. Peterson, 535 North Dearborn St., Chicago, Secretary.
Annual Congress on Medical Education and Licensure, Chicago, Feb. 16-17. Dr. William D. Cutter, 535 North Dearborn St., Chicago, Secretary.

American Academy of Orthopedic Surgeons, Atlantic City, N. J., Jan. 11-15. Dr. Rexford L. Diveley, 1103 Grand Ave., Kansas City, Mo., Secretary.

American Orthopsychiatric Association, Detroit, Feb. 19-21. Dr. Norvelle C. LaMar, 149 East 73d St., New York, Secretary.

Pacific Coast Surgical Association, San Francisco and Del Monte, Calif., Feb. 17-20. Dr. F. L. Reichert, Stanford University Hospital, San Francisco, Secretary.

Society of American Bacteriologists, Baltimore, Dec. 29-31. Dr. I. L. Baldwin, Agricultural Hall, University of Wisconsin, Madison, Wis., Secretary.

Society of Surgeons of New Jersey, Trenton, Jan. 28. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama State Medical Assn. Journal, Montgomery

11:117-148 (Oct.) 1941

- Goiter: Its Diagnosis and Treatment. J. M. Wilson, Mobile.—p. 117.
Congestive Heart Failure. W. Harlin Jr., Rome, Ga.—p. 120.
Surgical Complications of Peptic Ulcer. E. Drennen, Birmingham.—p. 123.
Cold in the Head: Its Effect on Sinuses. A. M. Walker, Tuscaloosa.—p. 125.
Idiopathic Hypocalcemia with Purpura: Treatment with Dihydratychsterol. J. F. McDowell, Birmingham.—p. 128.
Syphilis in Private Practice, 1938 and 1940. C. K. Weil and H. J. Climo, Montgomery.—p. 130.

American Journal of Diseases of Children, Chicago

62:701-908 (Oct.) 1941

- *Favism in Children. P. Robinson, Tel Aviv, Palestine.—p. 701.
Factors Influencing Retention of Nitrogen and Calcium in Period of Growth: IV. Effect of Estrogen. J. A. Johnston, Detroit.—p. 708.
Effect of Operative Procedures on Emotional Life of Child. G. H. J. Pearson, Philadelphia.—p. 716.
*Effect of Chemotherapy on Pneumonia in Infants Under One Year of Age. J. Greengard, Chicago; W. B. Raycraft, Oak Park, Ill., and W. G. Motel, Chicago.—p. 730.
McClure-Aldrich Test: Clinical Study and Evaluation. H. H. Lichtenberg, New York.—p. 743.
Incidence of Hypertrophic Pyloric Stenosis. A. Wallgren, Göteborg, Sweden.—p. 751.
*Intradermal Immunization: II, Diphtheria. M. L. Blatt, S. Fisher, and D. W. van Gelder, Chicago.—p. 757.
Sensitivity to Horse Serum Due to Previous Injections of Antigen. J. A. Toomey and W. P. Garver, Cleveland.—p. 765.
Infantile Amaurotic Family Idiocy: Its Relation to Niemann-Pick Disease and Other Disturbances of Lipid Metabolism: Report of Two Cases of Tay-Sachs Disease with Necropsy. J. L. Rothstein and Sara Welt, New York.—p. 801.

Favism.—Robinson states that in 1939 he encountered 5 cases of apparent Lederer's anemia but questioned the diagnosis when a year later his first 3 patients returned with the same disease. Shortly thereafter another patient was admitted to the hospital with the diagnosis of uremic coma. The history was typical of Lederer's anemia, but the mother mentioned that two days before the child, who was fond of the blossoms and the beans of Vicia fava, had eaten some uncooked beans. This detail brought favism to mind. Further questioning about the first 3 patients revealed that they had fallen ill on both occasions one or two days after eating broad beans. The other 2 patients seen in 1939 could not be traced, but in August 1940 a 12 year old boy and in January 1941 a 7 year old boy were admitted to the hospital with acute hemolytic anemia a day after they had eaten broad beans. Though favism has previously not been known in Palestine it seems probable that in some cases the illness diagnosed as blackwater fever was in reality favism. The pathogenesis of the disease is obscure. It occurs after the ingestion of uncooked or cooked beans and after inhaling the blossom dust. This, and the severe eosinophilia in the blood and the bone marrow, support the allergic theory.

Chemotherapy and Pneumonia.—Greengard and his co-workers point out that the mortality from pneumonia in children less than 1 year old in 1937 and 1938, before chemotherapy was used, was 32 and 31 per cent, respectively. From March 1939 to July 1940, 289 infants with pneumonia were treated. Eighty-nine of the patients were observed in 1939, when an attempt was made to control the experiment by selecting alternate patients for chemotherapy. The temperature became normal much more rapidly in the 46 infants treated with sulfapyridine: it reached normal by the fourth day, while

in the 43 control patients the temperature was not normal until the seventh day. Likewise the average duration of illness and hospitalization of the treated group were distinctly less than that of the control infants. Also, the pneumonia of the patients receiving sulfapyridine usually did not extend to areas of the lung not involved on admission. All the 200 patients treated in 1940 were given sulfapyridine as soon as the diagnosis was made. The gross mortality among these infants was 10 per cent. Further classification shows that among infants from birth to 3 months the mortality in 1937 was 44 per cent, 46 per cent in 1938 and 12 per cent in 1940. Similarly, in the group from 3 to 6 months of age the mortality in 1937 was 26 per cent, in 1938, 40 per cent and in 1940, 16 per cent. For those more than 6 months old the mortality in 1940 was 7 per cent, in 1937 it was 27.5 per cent and for 1938 it was 22 per cent.

Intradermal Immunization.—Blatt and his collaborators gave intradermal injections of diphtheria toxoid to the 228 positive reactors encountered among 945 children from 1 day to 19 years of age. Of the 228 positive reactors, 151 received one or two intradermal injections of 0.1 and/or 0.2 cc. of alum precipitated toxoid and 77 received intradermal injections of 0.1 and then 0.2 cc. of plain unmodified toxoid purchased on the open market. Of the 93 children given 0.1 cc. of alum precipitated toxoid 48 were retested at the end of six weeks and 7 showed positive Schick reactions. Eleven months after immunization 4 of the 7 still had positive Schick reactions. Of the 38 given 0.1 and then 0.2 cc. of alum precipitated toxoid 36 were retested after eleven months and all had negative Schick reactions. Three of the 20 given two 0.2 cc. doses of alum precipitated toxoid showed positive Schick reactions nine months later and 1 child after sixteen months still had a positive reaction. Only 1 of the 77 children given plain toxoid intracutaneously had a positive reaction after nine months. Sixteen months after the last inoculation, 2 of the children had positive Schick reactions. Unmodified toxoid gave rise to less severe local reactions than alum precipitated toxoid. Therefore the preferred method of diphtheria immunization appears to be the intradermal injection three weeks apart of 0.1 and then 0.2 cc. of unmodified toxoid (Ramon's anatoxin). This should be followed by a third injection if the Schick reaction is still positive.

American Journal of Ophthalmology, Cincinnati

24:1105-1232 (Oct.) 1941

- Role of Epinephrine in Formation of Intraocular Fluid. J. S. Friedenwald and W. Buschke, Baltimore.—p. 1105.
Experimental Transposition of Extraocular Muscles in Monkeys: Preliminary Report. P. J. Leinfelder and N. M. Black Jr., Iowa City.—p. 1115.
Protein Content of Aqueous Humor in Man. P. C. Kronfeld, Chicago.—p. 1121.
Histologic Eye Findings in Arachnodactyly. Georgiana Dvorak-Theobald, Oak Park, Ill.—p. 1132.
Glaucoma Associated with Hyaline Bodies (Drusen) of Optic Disk. A. G. Athens, Duluth, Minn.—p. 1138.
Tumors of Optic Nerve: Study of Thirteen Cases from Brazil, Diagnosis, Degree of Malignancy, Clinical Classification, Histopathologic Classification, Relation to von Recklinghausen's Disease, Methods of Surgical Treatment. J. Pereira Gomes, São Paulo, Brazil, South America, translated by C. A. Perera, New York.—p. 1144.
New Approach to Testing Eyes of School Children. T. H. Eames, Arlington Center, Mass.—p. 1170.
Retina and Intraocular Tension During Prolonged Insulin Coma, with Autopsy Eye-Findings. A. Gralnick, Central Islip, N. Y.—p. 1174.
Ocular Onchocerciasis. A. Quevedo, Guatemala, Central America, translation by F. A. Wies, New Haven, Conn.—p. 1185.

American Journal of Orthopsychiatry, Menasha, Wis.

11:619-808 (Oct.) 1941. Partial Index

- What Can Psychiatry Contribute to the Alleviation of National and International Difficulties? F. Alexander, Chicago; L. K. Frank, New York; J. F. Brown, Lawrence, Kan.; W. Overholser, Washington, D. C., and G. Zilboorg, New York.—p. 619.
Fascism: Challenge to Mental Hygiene. H. S. Ephron, New York.—p. 652.
What Is a Normal Mind? N. Cantor, Buffalo.—p. 676.
Mental Hygiene in a Special Public School for Maladjusted Children. A. Blau and Louise Vee, New York.—p. 691.
Homosexual Trends in Children. Lauretta Bender and S. Paster, New York.—p. 730.
Treatment of Fearful Children. J. H. Conn, Baltimore.—p. 744.
Behavior Problems in Children with Syphilis: Relation to Juvenile Paresis. R. L. Jenkins and Myrtle Crudin, Chicago.—p. 752.
Runaways and Nomads. L. G. Lowrey, New York.—p. 775.

American Journal of Pathology, Ann Arbor, Mich.

17:643-784 (Sept.) 1941

- Tribute to Dr. H. Gideon Wells, Investigator, Scholar, Teacher (Magister). A. B. Luckhardt, Chicago.—p. 643.
- Epithelial Metaplasia in Congenital Cystic Disease of Lung: Its Possible Relation to Carcinoma of Bronchus. N. A. Womack and E. A. Graham, St. Louis.—p. 645.
- Heredity as Determining Type and Site of Cancer and Age at Which It Occurs. Maud Slye, Chicago.—p. 655.
- Nonsaponifiable Lipid Fraction of Livers from Cancerous and Noncancerous Persons. P. E. Steiner, Chicago.—p. 667.
- Variation in Composition of Gallstones Simultaneously Formed in Gallbladder. D. B. Phenister and H. G. Aronson, Chicago.—p. 673.
- Certain Specific and Immunopathologic Features of Tuberculosis. H. J. Corper, Denver.—p. 681.
- Spread of Tubercle Bacilli by Sputum, Blood and Lymph in Pulmonary Tuberculosis. E. R. Long and R. Faust, Philadelphia.—p. 697.
- Cavities in Silicotic Lung: Pathologic Study with Clinical Correlation. A. J. Vorwald, Saranac Lake, N. Y.—p. 709.
- Age Factor in Active Immunization Against Whooping Cough. L. W. Sauer, Chicago.—p. 719.
- Antigenic Relationship of Alcohol Soluble Substances of Corpus Luteum to Those of Testis and Brain. J. H. Lewis, Chicago.—p. 725.
- Intrinsic Nerves of Immature Human Uterus. W. H. Brown and E. F. Hirsch, Chicago.—p. 731.
- Some Factors in Development, Localization and Reabsorption of Experimental Amyloidosis in Rabbit. G. F. Dick and L. Leiter, Chicago.—p. 741.
- Fatty Changes in Glomeruli of Kidneys. J. P. Simonds and J. D. Lange, Chicago.—p. 755.
- Degeneration of Adrenal Cortex Produced by Germanin. Eleanor M. Humphreys and Lilian Donaldson, Chicago.—p. 767.
- Acute Local Anaphylactic Inflammation of Lungs. P. R. Cannon, T. E. Walsh and C. E. Marshall, Chicago.—p. 777.

American Journal of Public Health, New York

31:1027-1120 (Oct.) 1941

- Present Status of Venereal Disease Control Program in Mobilization and National Defense. R. A. Vonderlehr, Washington, D. C.—p. 1027.
- What the Navy Is Doing to Protect Its Personnel Against Venereal Disease. F. R. Lang, Washington, D. C.—p. 1032.
- Immunity and Positive Tuberculin Reaction. L. Brahdry, New York.—p. 1040.
- Hospital Records as Source of Morbidity Statistics. Clara E. Councell, Bethesda, Md.—p. 1044.
- Mortality Statistics and Physician: Argument for Classifying Deaths According to Informed Medical Judgment. J. V. DePorte, Albany, N. Y.—p. 1051.
- Nursing Care of Sick as Part of Complete Nursing Service in Rural Areas. Helene B. Buker, Lansing, Mich.—p. 1057.
- Appraisal of Nutritional Status. F. G. Boudreau, New York; C. E. Palmer, Washington, D. C.; W. M. Schmidt, Dorothy G. Wiehl and H. D. Kruse, New York.—p. 1061.

American Review of Tuberculosis, New York

44:377-508 (Oct.) 1941

- Weather and Resistance in Pulmonary Tuberculosis: Part I. W. F. Petersen, J. S. Howe and M. E. Milliken, Chicago.—p. 377.
- Cellular Reactions to Fractions from Tubercle Bacilli. Florence R. Sabin, Denver.—p. 415.
- *Bilateral Tuberculous Pleural Effusions: Study of Forty-Five Cases. A. L. Paine, Ninette, Man., Canada.—p. 424.
- Clubbed Fingers in Pulmonary Tuberculosis. R. H. Kaplan and L. Munson, Castle Point, N. Y.—p. 439.
- *Follow-Up of 1,041 Tuberculous Patients. Margaret G. Stephens, New York.—p. 451.
- Case Finding in Chinese Population of San Francisco. W. C. Voorsanger and G. B. Miller, San Francisco.—p. 463.
- Pneumoperitoneum in Treatment of Pulmonary Tuberculosis. W. O. Fowler, Orlando, Fla.—p. 474.
- Tuberculosis in Students. J. A. Myers, Minneapolis.—p. 479.

Bilateral Tuberculous Pleural Effusions.—Paine reviews the 45 cases of bilateral tuberculous pleural effusions encountered at the Manitoba Sanatorium during the last twenty years. In none of the patients was pneumothorax present. The author states that the bilateral involvement was not merely an effusion of the two sides but usually a manifestation of a widely disseminated infection in a person who had unusual powers of resistance but in whom all too often multiple foci of disease eventually developed. The prognosis in bilateral tuberculous effusion is distinctly more grave than in unilateral effusion. Aside from its being followed by a higher percentage of pulmonary tuberculosis, organs (besides the lungs) seldom affected in unilateral pleurisy are involved. Furthermore, often several organs become involved. Bilateral effusion is usually a manifestation of hematogenous infection and not infrequently of generalized miliary tuberculosis. This seems to explain why the presence or absence of pulmonary tuberculosis at the onset

of pleurisy has no particular bearing on the subsequent tuberculosis in other organs and why sanatorium treatment apparently does not materially improve the prognosis.

Follow-Up of Tuberculous Patients.—Stephens states that the status of 1,041 tuberculous patients from the home office and field or sales force of the Metropolitan Life Insurance Company three years after their admission to a sanatorium was: Of the men in the minimal stage of the disease 83.8 per cent were able to work as compared with 30.2 per cent in the far advanced stage; of the women 77.6 and 12.7 per cent were able to work. After five and ten years the same results with regard to stage held true. Death from tuberculosis among persons in the minimal stage who were being cured was fairly infrequent even after the tenth year, when more than half of those with far advanced disease had died. The chances of recurrence among 761 ex-patients who completed their cure and were able to return to their work before December 1938 averaged for the men who were cured in the minimal stage 7.3 per cent per year for five years. This is equivalent to saying that 36.5 per cent of this group will have had a recurrence by their fifth anniversary of completion of cure (ability to resume occupation). For the women the average was 3.9 per cent per year, equivalent to 19.5 per cent in five years. The men in the moderately and far advanced stages had an average recurrence rate of 11.2 per cent per year, or 56 per cent in five years, as compared with 6.1 and 30.5 per cent for the women. These high readmission rates were experienced in spite of favorable conditions during the first cure and supervised rehabilitation. On the fifth anniversary of completion of cure 90 per cent of the ex-patients treated originally in the minimal stages of the disease were at work or were able to work, as compared with 75 per cent of those with advanced tuberculosis.

Archives of Internal Medicine, Chicago

68:663-850 (Oct.) 1941

- Bronchiolitis Fibrosa Obliterans: Report of Case. J. S. LaDue, New Orleans.—p. 663.
- Origin of Ketone Bodies from Fats and Their Regulation. S. Soskin and R. Levine, Chicago.—p. 674.
- Acropachyderma with Pachyperiostitis: Report of Case. H. G. Brugsch, Boston.—p. 687.
- *Acacia in Treatment of Nephrotic Syndrome: Influence of Acacia, Injected Intravenously, on Concentration of Proteins and on Colloid Osmotic Pressure of Serum. A. Goudsmit Jr., Philadelphia; M. W. Binger and Marschelle H. Power, Rochester, Minn.—p. 701.
- Adrenocortical Compounds in Blood: Relation of Their Quantity to Arterial Hypertension, Renal Insufficiency and Congestive Heart Failure. W. Raab, Burlington, Vt.—p. 713.
- Determination of Urobilinogen in Feces and in Urine: Comparison of the Sparkman and the Watson Procedure. C. J. Watson and Eleanor B. Bilden, Minneapolis.—p. 740.
- *Direct Cultivation of Bacterium Tularensis from Human Blood Drawn During Life and at Autopsy: Report of Three Fatal Cases of Tularemia, with Brief Notes on Two Others. J. C. Ransmeier, Nashville, Tenn., and Isabelle G. Schaub, Baltimore.—p. 747.
- Gastroenterology: Review of Literature from July 1940 to July 1941. C. M. Jones, Boston.—p. 763.

Acacia in Treatment of Nephrotic Syndrome.—Goudsmit and his associates observed the changes of the serum proteins and the colloid osmotic pressure before and after the intravenous injection of acacia in 28 patients with the nephrotic syndrome. After acacia was administered the edema of 20 patients disappeared promptly, 3 patients with edema failed to respond with diuresis and in 5 no edema was present when treatment with acacia was begun. Statistical analysis of the data reveals a lack of correlation between diuretic response and changes of colloid osmotic pressure; for example, in 4 patients in whom a frank decrease of colloid osmotic pressure was observed the diuretic response was just as satisfactory as in 9 in whom the colloid osmotic pressure was definitely increased. The concentration of serum proteins usually diminished after injections of acacia; the average decrease was 22 per cent of the original concentration. The decrease could not be correlated with the amount of acacia given, the resultant concentration of acacia in the serum or the initial concentration of serum proteins. Increases in circulating plasma volume and concomitant dilution of the constituents of the plasma appeared to account adequately for the decrease of serum proteins. The gross changes in colloid osmotic pressure subsequent to treatment with acacia are directly related to the absolute changes of the

concentration of the serum proteins and of the concentration of acacia. In approximately half of the patients the calculated changes were within 6 mm. of the observed values. These changes were unrelated to the therapeutic effect.

Pasteurella Tularensis.—Ransmeier and Schaub discuss the data of 3 patients who died of tularemia and on whom necropsy was performed at the Johns Hopkins Hospital in December of 1937, 1938 and 1939, and data of 2 patients who died at Vanderbilt University Hospital in 1940. *Pasteurella tularensis* was cultured directly on blood-dextrose-cystine agar from the blood of 2 of the first 3 patients during life and from all 3 at necropsy. In addition, the organism was cultured from a pustule on a finger of 1 patient during life and from peritoneal fluid at necropsy and from the lungs of 2 post mortem. From 1 of the 2 other patients *Past. tularensis* was recovered by direct culture and by mouse inoculation from pleural fluid during life and by direct culture from heart blood at necropsy. The organism in the other patient was found on direct culture of the venous blood four days before death, in the pleural fluid three days before death and in the heart blood after death.

Archives of Pathology, Chicago

32:507-688 (Oct.) 1941

- Genesis of Atherosclerosis. T. Leary, Boston.—p. 507.
Lipids in Kidney. R. H. Fuller, Cincinnati.—p. 556.
Pathology of Disseminated Lupus Erythematosus. P. Klemperer, A. D. Pollack and G. Baehr, New York.—p. 569.
Influence of Promin, Starch and Heptaldehyde on Experimental Leprosy in Rats. E. V. Cowdry and C. Ruangsiri, St. Louis.—p. 632.
Tuberculous Spondylitis: Histologic Study. B. N. E. Cohn, Denver.—p. 641.
*Postmortem Diagnosis of Allergic Shock: Value of Prausnitz-Küster Reaction. H. Lund, Boston, and E. L. Hunt, Worcester, Mass.—p. 664.
General Pathology and Some Special Complications of Alcoholism. A. W. Wright, Albany, N. Y.—p. 670.

Postmortem Diagnosis of Allergic Shock.—Lund and Hunt established, by the passive transfer method, a diagnosis of allergy at the necropsy of a white woman following the injection of guinea pig protein. The patient, a ward maid in a hospital, had volunteered to serve as a control subject in an investigation in which normal and psychopathic persons were given intracutaneous injections of small amounts of guinea pig hemoglobin. At 9:09 a. m. she and many other volunteers received 0.2 cc. of a solution of guinea pig hemoglobin. Within a few minutes she complained of headache, and respiratory distress, wheezing and intense cyanosis set in. One subcutaneous and three intracardiac injections of epinephrine hydrochloride were given without avail. At 9:25 a. m. she was pronounced dead. All the volunteers were interrogated concerning past illnesses and particularly concerning allergy; the woman who died had withheld the information that she had heart disease and asthma. Despite the fact that sensitivity to guinea pig protein is not common and that the dose given was small, the authors felt that the most tenable explanation of their subject's fatal collapse was allergic shock. It seemed highly desirable to demonstrate whether or not there was in her blood a specific reagin to guinea pig hemoglobin. A specific sensitizing agent corresponding with the material injected was found in the blood serum by the technic of passive transfer. Further investigation revealed hereditary hypersensitivity, anaphylactic death of the patient's mother's cousin and asthma and hay fever in her mother. The deceased had no known contact with guinea pigs, indicating that the development of hereditary hypersensitivity does not necessarily require antecedent contact with the specific exciting substance.

California and Western Medicine, San Francisco

55:167-224 (Oct.) 1941

- Surgery of Stomach and Duodenum. W. Walters, Rochester, Minn.—p. 175.
The Practitioner and Problems of Diabetes. R. F. Loeb, New York.—p. 182.
Intestinal Bleeding in Infants and Children. L. R. Chandler, San Francisco.—p. 187.
Group Practice. R. V. Lee, Palo Alto.—p. 190.
Synthetic Estrogens: Clinical Experiences with Some of the Newer Forms. C. K. Canelo, San Jose, and H. Lisser, San Francisco.—p. 195.
Tri bromethanol Nitrous Oxide Anesthesia: Its Use in Thoracic Surgery. J. H. Hutton, Portland, Ore.—p. 198.
Sulfanilamide in Ophthalmology. G. P. Landegger, Los Angeles.—p. 200.

Cancer Research, Baltimore

1:771-848 (Oct.) 1941

- *Postirradiation Changes in Levels of Organic Phosphorus in Blood of Patients with Leukemia. J. C. Abels, J. M. Kenney, L. Craver, L. D. Marinelli and C. P. Rhoads, New York.—p. 771.
Isotopic Constitution of Potassium in Animal Tumors and Muscle from Tumor-Bearing Animals. A. Lasnitzki and A. K. Brewer.—p. 776.
Xanthine Oxidase (Dehydrogenase) Activity in Livers of Mice of Cancer Susceptible and Cancer Resistant Strains. F. H. J. Figge, and L. C. Strong, New Haven, Conn.—p. 779.
Transplantation of Leukemia Arising in Hybrid Mice. A. Kirschbaum and L. C. Strong, New Haven, Conn.—p. 785.
Effect of Testosterone Propionate on Mammary Tumors in Mice of C3H Strain. E. Elizabeth Jones.—p. 787.
Studies on Effect of Foster Nursing and Its Relation to Development of Mammary Carcinoma in Mouse. W. S. Murray, Buffalo.—p. 790.
Foster Nursing and Genetic Susceptibility for Tumors of Breast in Mice. J. J. Bittner, Bar Harbor, Maine.—p. 793.
Abnormalities of Breeding Behavior in Rats of the Albany (A-S) Strain. M. V. Danzi, Ethel Burack and A. W. Wright, Albany, N. Y.—p. 795.
Action of Yeast Extract on Transplanted and Spontaneous Malignant Tumors in Mice. R. Lewisohn, C. Leuchtenberger, R. Leuchtenberger, D. Laszlo and K. Bloch, New York.—p. 799.
Mechanism of Carcinogenesis: Study of Significance of Carcinogenic Action and Related Phenomena. I. Berenblum, Oxford, England.—p. 807.
Failure to Induce Sarcoma in Rats with Wheat Germ Oil Preparations. A. M. Brues, Boston, Beula B. Marble and B. Riegel.—p. 815.
Effect of Carcinogenic Hydrocarbons and Related Compounds on Autoxidation of Oils. H. F. Deutsch, D. L. Miner and H. P. Rusch, Madison, Wis.—p. 818.
Induction of Tumors in Rats by Carcinogens in Various Lipids. H. A. Davenport, J. L. Savage, M. J. Dirstine and F. B. Queen, Chicago.—p. 821.

Postirradiation Levels of Blood Phosphorus.—Abels and his associates state that the ingestion of subtherapeutic doses of radioactive phosphorus by 5 patients with leukemia was followed by a rapid increase in the concentration in the erythrocytes of the organic acid-soluble phosphorus compounds. Subsequently, an increased concentration in both the erythrocytes and the leukocytes was observed. This was not the case after the ingestion of nonradioactive phosphorus. To establish whether the change was due to the radioactivity of the phosphorus or to some chemical property of this isotope, the entire bodies of patients were irradiated and direct exposure of the cardiac area was resorted to to ascertain the change in organic acid-soluble phosphorus levels which followed. The irradiation of the whole body was administered by a 185 kilovolt machine at a distance of 500 cm. and at a rate of 0.4 r per hour. The cardiac irradiation was administered by a 150 kilovolt machine with 1 mm. of copper filter, at a distance of 60 cm. through a 10 cm. cone. The results, while qualitatively uniform, varied quantitatively from patient to patient, but the one binding characteristic in all patients was that there was a definite alteration of the organic acid-soluble phosphorus levels in the leukocytes, and usually of the erythrocytes, after all types of irradiation. The alterations following the ingestion of the phosphorus and the irradiation are probably due to the radioactivity of the isotope.

Florida Medical Association Journal, Jacksonville

28:101-148 (Sept.) 1941

- Medicine and the Florida Criminal Law. F. H. Dieterich, Miami.—p. 115.
Pain Produced by Urologic Disease. R. B. Carson, Fort Lauderdale.—p. 120.
Use of Endocrines in Treatment of Functional Menstrual Disorders. T. H. Wallis, Ocala.—p. 122.
The Ways of Law and Medicine. S. Brittingham, Norfolk, Va.—p. 126.

Indiana State Medical Assn. Journal, Indianapolis

34:541-580 (Oct.) 1941

- The Medical Front—Digest of Doctor's Situation. A. M. Mitchell, Terre Haute.—p. 541.
Sulfanilamide in Appendicitis with Abscess. M. N. Hadley, Indianapolis.—p. 543.
Influenza. R. A. Flack, Lafayette.—p. 544.
Suicide. J. J. Westra, Muncie.—p. 546.
Anorectal Diseases. H. H. Wheeler, Indianapolis.—p. 548.
Brachial Birth Paralysis. K. A. Fischer, Louisville, Ky.—p. 552.
Dr. Oliver Wendell Holmes—Some Unpublished Medical Case Records. C. L. Poston, Richmond.—p. 556.
Phonocardiograph Studies on Heart Diseases. H. N. Middleton, Indianapolis.—p. 559.
Nonmedical Reading for Physicians. H. J. Weil, Indianapolis.—p. 564.

Iowa State Medical Society Journal, Des Moines

31:457-510 (Oct.) 1941

- Persistence of Function of Skin Grafts Through Long Periods of Growth. J. B. Brown and F. McDowell, St. Louis.—p. 457.
 Prophylactic and Therapeutic Use of Oxygen in Surgical Patient. S. C. Cullen and J. E. Shevis, Iowa City.—p. 462.
 Intratracheal Anesthesia in Head Operations. J. A. Thorson, Dubuque.—p. 465.
 Severe Gastrointestinal Complication Following Use of Sulfapyridine. S. D. Maiden, Council Bluffs.—p. 472.
 Hypertension: Modern Concepts in Diagnosis and Management. E. W. Anderson, Des Moines.—p. 475.
 Use and Abuse of Sedatives. C. F. Obermann, Cherokee.—p. 478.
 Some Problems in Anesthesia. Florence D. Johnston, Cedar Rapids.—p. 485.

Journal of Urology, Baltimore

46:147-354 (Aug.) 1941. Partial Index

- Pathogenesis of Polycystic Kidneys: Reconstruction of Cystic Elements in Four Cases. R. F. Norris and L. Herman, Philadelphia.—p. 147.
 Nephroscope with Removal of Stone Following Nephrostomy for Obstructive Calculous Anuria. E. Rupel and R. Brown, Indianapolis.—p. 177.
 Nephrolithiasis Complicating Chronic Ulcerative Colitis After Ileostomy: Report of Six Cases. W. W. Lindahl and J. A. Bargen, Rochester, Minn.—p. 183.
 Incidence and Significance of Deposition of Calcium Plaques in Renal Papilla as Observed in Caucasian and Negro (Bantu) Population in South Africa. V. Vermooten, New Haven, Conn.—p. 193.
 Perinephric Abscess: Review of 117 Cases. D. W. Atcheson, New Orleans.—p. 201.
 Albuminuria from Standpoint of the Urologist. T. L. Howard, Denver.—p. 241.
 Modern Methods of Handling Prostatic Obstruction: Evaluation of Transurethral Resection Based on 700 Cases. W. A. Milner and H. C. Engster, Albany, N. Y.—p. 278.
 Relationship of Serum Acid Phosphatase Determination to Presence of Bone Metastases from Carcinoma of Prostate. C. C. Herger and H. R. Sauer, Buffalo.—p. 286.
 Effect of Female Sex Hormone on Function of Human Testis. N. J. Heckel and C. R. Steinmetz, Chicago.—p. 319.
 Comparison of Bactericidal Effect of Low Concentrations of Sulfanilamide and Sulfathiazole on Bacteria from Urinary Infections. H. F. Helmholz, Rochester, Minn., with technical assistance of Nora Larson.—p. 322.
 Sulfapyridine Therapy in Treatment of Gonococcal Urethritis Resistant to Sulfanilamide. J. H. Semans, Baltimore.—p. 332.

46:567-806 (Oct.) 1941. Partial Index

- Prognosis in Bilateral Renal Tuberculosis. W. F. Braasch and E. B. Sutton, Rochester, Minn.—p. 567.
 Control and Arrest of Lesions of Renal Tuberculosis. G. J. Thomas, T. L. Stebbins, Minneapolis, and S. T. Sandell, Oak Terrace, Minn.—p. 579.
 *Spontaneous Healing in Renal Tuberculosis. E. W. Beach and W. G. Shultz, Sacramento, Calif.—p. 590.
 Apparent Cure of Hypertension by Nephrectomy. C. E. Burkland, Sacramento, Calif.—p. 638.
 Hypertension. New Clinical Concept of Its Etiology. A. Ravich, Brooklyn.—p. 641.
 Relation of Ureteral Length to Trunk Length and Body Height in Children. R. W. Coffelt and D. A. Charnock, Los Angeles.—p. 667.
 Spastic Ureteritis (Ureteral Stricture): Essential Clinical Considerations. H. W. E. Walther and R. M. Willoughby, New Orleans.—p. 671.
 Rectourethral Fistula Following Perineal Prostatectomy: Report of Four Cases. C. F. Rusche and S. K. Bacon, Hollywood, Calif.—p. 699.
 Studies of Blood Loss During Transurethral Prostatic Resection. R. M. Nesbit and K. B. Conger, Ann Arbor, Mich.—p. 713.
 Ten Years' Experience in Management of Cryptorchidism. V. S. Counseller, Rochester, Minn.—p. 722.
 Studies in Malignant Testis Tumors: V. Tumors Developing After Orchiectomy: Report of Two Cases and Review of Sixty-Three. J. B. Gilbert, Schenectady, N. Y.—p. 740.
 Crystallography of Urinary Sediments with Clinical and Pathologic Observations in Sulfonamide Drug Therapy. E. L. Prien, Boston, and C. Frondel, Cambridge, Mass.—p. 748.
 Obstruction at Neck of Bladder Incorrectly Diagnosed as Neurogenic Bladder. J. R. Dillon, San Francisco.—p. 759.
 *Urologic Complications of Cancer of Rectum. J. A. Seaman and C. Bunig, Springfield, Mass.—p. 777.
 Additional Uses for Tidal Drainage. W. G. Hayward, Jamestown, N. Y.—p. 793.
 Oliguria. Review of Five Cases. W. D. Warrick, Birmingham, Ala.—p. 799.

Spontaneous Healing in Renal Tuberculosis.—To prove the contention that spontaneous clinical or objective healing may and does occur in patients with early renal tuberculosis, that is before caseation or extensive anatomic changes take place, Beach and Shultz report the histories of 8 such patients who were under their supervision for six to fifteen years. As signs of tuberculosis elsewhere in the body were absent, diagnosis of renal tuberculosis depended on the recovery and identification

of tubercle bacilli from the urine from one or both kidneys. Varying numbers of pus cells and erythrocytes were always present in the urine from the bladder. Urologic study was usually suggested by the discovery of pus in the urine. During the periodic follow-up examinations of these 8 patients the objective findings or subjective symptoms have not recurred, and in their absence the authors feel justified in concluding that the tuberculous renal lesion or lesions from which these persons suffered at first healed spontaneously.

Complications of Cancer of Rectum.—Seaman and Binnig say that, of 111 patients with cancer of the rectum seen at the Westfield State Hospital from December 1937 to April 1, 1941, 68 were available for preoperative and postoperative observation. The ages of the patients ranged from 20 to 79; 41 were men and 27 women. Eighteen of the men had frequency or urgency of urination or burning during urination. Most of the women complained of some degree of frequency. However, it was not attributable to the rectal growth; leukorrhea was believed to be responsible in nearly all of them. A combined abdominoperineal operation of the one stage Miles type was performed in 42, 6 had the two stage Lahey operation, 4 had a Mikulicz procedure, 8 had posterior resection and the others had modifications of these operations. Postoperatively 2 had pronounced stricture of the deep part of the urethra, 4 had perineovesical fistula, 1 had ureterovaginal fistula, most patients had infection of the bladder, 1 had a ureter tied off accidentally during the perineal part of a resection, 3 had hydronephrosis on the right and 3 on the left side, 1 had pyonephrosis, 2 had infected hydronephrosis on the right side, many patients had dysfunction of the bladder (but no complete neurogenic conditions), and sexual potency, if still possessed before surgical intervention, was lost permanently afterward. There were 2 instances of epididymitis. Urologic complications vary in occurrence and severity, and they are more often due to sympathetic or parasympathetic destruction or some degree of trauma, possibly also to infection. Infection, because of the nerve disturbance and the altered position of the base of the bladder, is a common attendant.

Kansas Medical Society Journal, Topeka

42:369-412 (Sept.) 1941

- Cancer of Rectum. N. A. Womack, St. Louis.—p. 369.
 Nicoll Flap Operation for Empyema. B. A. Nelson, Manhattan.—p. 374.
 X-Ray Studies of Female Pelvis. A. Brown, Salina.—p. 378.
 Management of Edema and Nephritis in Children. J. H. Bena, Pittsburgh.—p. 382.
 Changes in Blood in Tubal Pregnancy. M. A. Walker, Kansas City.—p. 385.
 Enterococcal Endocarditis Due to *Streptococcus fecalis*: Report of Two Cases. T. R. Hamilton and Bette Wasson Hamilton, Kansas City.—p. 388.

Kentucky Medical Journal, Bowling Green

39:369-404 (Oct.) 1941

- Responsibilities of Medicine. E. L. Henderson, Louisville.—p. 372.
 Changes in Surgical Treatment of Peptic Ulcer. G. Aud, Louisville.—p. 377.
 Epilepsies. T. Scott, Lexington.—p. 381.
 Newer Applications of Peritoneoscopy and a New Instrument to Aid the Procedure. J. E. Hamilton, Louisville.—p. 387.
 Trichinosis: Case Report. J. E. Winter, Louisville.—p. 391.
 Medical Monuments. J. M. Salmon, Ashland.—p. 393.
 Malignancy. H. C. Chance, Pineville.—p. 397.
 Analysis of Thirty-Seven Cases of Syphilis. T. A. Griffith, Mount Vernon.—p. 400.

Laryngoscope, St. Louis

51:821-902 (Sept.) 1941

- Otogenic Complications: Resumé and Discussion of Literature for 1940. L. G. Richards, Boston.—p. 821.
 Analysis of Speech Characteristics in Deafened Children, with Observations on Training Methods. W. Hughson, A. Ciocco, E. G. Warrick, and P. S. Lawrence, Abington, Pa.—p. 868.
 Otogenous Tetanus. S. Rosen, New York.—p. 892.
 Right Upper Lobe Bronchoscopy—Position That Facilitates the Procedure. W. B. Faulkner Jr., San Francisco.—p. 894.

Maine Medical Association Journal, Portland

32:205-224 (Sept.) 1941

Clinical Study of Obstetric Paralysis. C. W. Ruhlin, Bangor.—p. 205.
The Word Is Cause, Doctor. P. B. Stinson, Augusta.—p. 209.

32:225-250 (Oct.) 1941

Review of Literature on Blood and Plasma Transfusions. J. E. Porter, Portland.—p. 225.
What Is Dementia Precox? I. Newman, Augusta.—p. 231.
Congenital Factors in Urinary Infections. S. N. Vose and F. P. Morse Jr., Boston.—p. 236.

Michigan State Medical Society Journal, Muskegon

40:761-840 (Oct.) 1941

Adjustment of Marital Problems. L. S. Selling, Detroit.—p. 789.
Uterine Fibroids Complicating Pregnancy. J. R. Willson, Ann Arbor.—p. 795.
Varicose Veins: Allergic Reactions in Injection Treatment. S. Rosenzweig, M. Ascher and L. Zlatkin, Detroit.—p. 800.
Method for Correction of Angulation in Fractures of Long Bones. V. M. Moore, Grand Rapids, and P. A. Van Pernis, Chicago.—p. 806.
Severe Fractures of Ankle Joint: Conservative Management and Presentation of Typical Cases. H. C. Lavender, Kalamazoo.—p. 807.
Hypothyroidism in Children: Review of Masked Symptoms and Evaluation of Response to Thyroid Treatment. A. M. Hill and J. E. Weber, Grand Rapids.—p. 811.
*Progressive Pseudohypertrophic Muscular Dystrophy: New Regimen of Treatment. H. E. Branch, Flint.—p. 814.
Sarcoma of Urinary Bladder: Report of Case. W. E. Keane, Detroit.—p. 823.

Pseudohypertrophic Muscular Dystrophy.—Branch based the following regimen on the five important facts (increase of creatine in the urine, gradual replacement of degenerating muscles by fatty infiltration, decrease or absence of magnesium in the muscle, decrease of myoglobin in the muscle and the tendency to spontaneous arrest as the person affected matures) known about progressive muscular dystrophy: 1. He gave 8 patients estrogen in an effort to influence the creatine-creatinine utilization and excretion. 2. Choline, in the hydrochloric or chloride form, was given in an effort to influence the metabolism and deposition of fat. 3. An abundance of cow's or goat's milk was given in an attempt to enhance the availability of magnesium. 4. Anemia was prevented. 5. Gonadotropic substance was given in an attempt to hasten maturity and enhance the effect of the estrogen. 6. In addition, general setting-up exercises, physical therapy, fresh air and sunshine were provided. The condition of 2 of the 8 patients treated was hopeless, and they were used only to observe the effect of the estrogen. The creatinine excretion was definitely increased after treatment was started and was maintained at normal, with occasional elevations above normal. The other 6 patients were given the regimen in an effort to improve their general condition and arrest the progress of the disease. A noticeable increase in muscular strength was experienced by 3 patients, 2 were improved and at first 1 was slightly improved but had bilateral otitis media and mastoiditis and the end result was a total failure. The author points out that results over three and a half years have been so encouraging that he presents this preliminary report in the hope that other workers will try the regimen and prove or disprove its value.

New England Journal of Medicine, Boston

225:519-560 (Oct. 2) 1941

Carcinoma of Lung: Bronchoscopic Aspects. R. H. Betts, Brookline, Mass.—p. 519.
Auscultation of Heart. S. A. Levine, Boston.—p. 526.
Pollens and Mold Survey of Southwestern New England—1940. H. N. Pratt, A. Colmes, J. Fromer, J. E. Greene, Boston; F. H. Chaffee, Providence, R. I., and W. B. Clapp, Worcester, Mass.—p. 533.
Physical Therapy. A. L. Watkins, Boston.—p. 539.

New Jersey Medical Society Journal, Trenton

38:495-556 (Oct.) 1941

Decline in Prevalence of Syphilis as Shown by Routine Tests in Hospital. A. J. Casselman and Anabel Cadwallader, Trenton.—p. 499.
Differential Diagnosis of Acute Lower Abdominal Lesions in Female. W. J. Carrington, Atlantic City.—p. 504.
Psychosomatic Concept in Modern Medicine. H. Wallace, New York.—p. 509.
The General Practitioner and the Electrocardiogram. J. H. Rowland, New Brunswick.—p. 513.
Epidemic Influenza. F. Hnat, Elizabeth.—p. 518.
Rheumatic Infection in Childhood. E. L. Bauer, Philadelphia.—p. 521.
Relationship Between the Medical Profession and the Hospital. E. J. Smith, Belleville.—p. 528.

Pennsylvania Medical Journal, Harrisburg

45:1-96 (Oct.) 1941

Hodgkin's Disease of Duodenum. L. C. Pusch, York.—p. 20.
Rupture of Rectus Abdominis Muscle and Associated Lesions: Collective Review and Report of Two Cases. J. C. Bulfamonte, Shamokin.—p. 22.
Surgical Treatment of Leg Length Discrepancies. P. H. Harmon, Sayre.—p. 27.
Atraumatic Surgical Suction Tube. D. J. Preston, Wilmington, Del.—p. 35.
Calcaneous Tendinitis (Peritendinitis Calcarea) at Greater Trochanter of Femur. L. Kaplan, Philadelphia.—p. 37.
Management of Nose and Paranasal Sinuses in Asthma. A. T. Smith, Philadelphia.—p. 41.
*Supraventricular Tachycardia in Infancy. R. M. Keagy and R. S. Magee, Altoona.—p. 44.

Supraventricular Tachycardia in Infancy.—Keagy and Magee report that giving acetyl- β -methylcholine chloride subcutaneously terminated five attacks of supraventricular tachycardia in a boy aged 5 months. The optimal dose of the drug was 6 mg. The attack on admission was one of several which had occurred since birth, the first having occurred at 2 months. After the fourth attack in the hospital the patient was given 0.064 Gm. of digitalis twice a day in an effort to prevent further attacks. The dose was subsequently reduced until 0.008 Gm. was given daily. This proved inadequate, and a daily maintenance dose of 0.011 Gm. was decided on; the child has since had no attacks and has progressed well. An electrocardiogram taken three days after digitalis therapy was instituted shows a normal auricular and ventricular mechanism and a heart rate of 120 per minute. Although the authors feel that it is safe to use acetyl- β -methylcholine chloride they suggest that atropine be available if untoward toxic symptoms should arise. They believe that powdered digitalis leaf has been responsible for the absence of paroxysms. They say that to date there has been no substantial evidence suggesting active pathologic cardiac changes and that the diagnosis of congenital heart defect is not justifiable, although it may be suspected, as the patient has congenitally deformed ears and his sister has congenitally webbed toes.

Public Health Reports, Washington, D. C.

56:1901-1940 (Sept. 26) 1941

*Epidemic of Infectious Encephalitis. J. P. Leake.—p. 1902.
*Isolation of Western Equine Encephalomyelitis Virus from Naturally Infected Prairie Chicken. H. R. Cox, W. L. Jellison and L. E. Hughes.—p. 1905.
Eosinates of Azures and Methylene Blue in Preparation of Satisfactory Giemsa Stain from Dyes of American Manufacture. M. A. Roe, A. Wilcox and R. D. Lillie.—p. 1906.
Twenty-Four Hour Output of Certain Urinary Constituents in Persons Exposed to Lead Arsenate Spray Residue. S. H. Webster.—p. 1910.
Development of Leprous Process in Rats at Site of Inoculation with Material from Human Leprosy. G. L. Fite.—p. 1919.

Epidemic of Infectious Encephalitis.—Leake states that the largest encephalitis epidemic on record in North Dakota and bordering states and provinces has just ended. In North Dakota there were 1,080 cases with 96 deaths, an incidence of 167 per hundred thousand and a mortality of 8.9 per cent. The uniformity of symptoms and the spread of the disease throughout the area affected by the epidemic suggested that only one disease, western equine encephalitis (proved by serum-neutralizing tests), was responsible for the epidemic. In determining its spread it was found that the tremendous predominance among working men could be accounted for only by differences in exposure. Since the male population of working age has a greater exposure in the wheat fields than the female population a reservoir or reservoirs other than man or horses was looked for. Cox, Jellison and Hughes found the virus of western equine encephalitis in all animals inoculated in the spleen and the central nervous system with material isolated from the brain and the spleen of a prairie chicken, a bird of the grain fields. This indicates carriage via the blood and blood infectiousness.

Isolation of Western Equine Encephalomyelitis Virus from Prairie Chicken.—Cox and his associates believe that they are the first to report the isolation of the virus of western equine encephalitis from a prairie chicken. At the time that the bird was killed encephalitis was occurring in many human beings in the immediate vicinity of Rugby, N. D., which in fact was one of the chief foci of the epidemic.

Quarterly J. Studies on Alcohol, New Haven, Conn.

2:241-452 (Sept.) 1941

- Penal and Correctional Aspects of Alcohol Problem. A. H. MacCormick, New York.—p. 241.
- Neuropathologic Findings in Brain and Spinal Cord of Chronic Alcoholic Patients. L. Alexander, Boston.—p. 260.
- Factors Influencing Effects of Alcohol on Blood Sugar and Liver Glycogen. D. M. Tennent, New Haven, Conn.—p. 263.
- Influence of Alcohol on Emptying Time of Stomach and Absorption of Glucose. D. M. Tennent, New Haven, Conn.—p. 271.
- Psychogenesis of Alcoholism. P. Schilder, New York.—p. 277.
- Psychiatric Resultants of Alcoholism: Alcoholism and Mental Disease. N. D. C. Lewis, New York.—p. 293.
- Alcoholic Mental Disorders. K. M. Bowman, New York, and E. M. Jellinek, New Haven, Conn.—p. 312.

Surgery, Gynecology and Obstetrics, Chicago

73:433-600 (Oct.) 1941

- Chronic Pericardial Disease: Report of Twenty-Eight Cases of Constrictive Pericarditis. A. Blalock, Baltimore, and C. S. Burwell, Boston.—p. 433.
- Evaluation of Incapacity Produced by Injuries of Peripheral Nerves. L. J. Pollock, Chicago.—p. 462.
- *Diagnosis of Chronic Enlargement of Leg, with Description of New Syndrome. J. C. Luke, Montreal, Canada.—p. 472.
- Theca Cell Tumors (Thecoma). A. H. Curtis, Chicago.—p. 481.
- Operation for Cure of Congenital Atresia of Esophagus. B. N. Carter, Cincinnati.—p. 485.
- *Study of Platelet Count and Coagulation Time of Plasma and Whole Blood Following Operation. W. J. Potts and Elisabeth Pearl, Oak Park, Ill.—p. 492.
- Oxygen Therapy in Shock Due to Hemorrhage. J. G. Schnedorf and T. G. Orr, Kansas City, Kan.—p. 495.
- *Uterine Contractions of Early Pregnancy and Their Relation to Duration of Labor: Study of 250 Patients Made with Lóránd Tocograph. D. P. Murphy, Philadelphia.—p. 498.
- *Liver Insufficiency in Toxic Goiter and Its Treatment. C. R. Schmidt, W. S. Walsh and V. E. Chesky, Halstead, Kan.—p. 502.
- Total Cystectomy Combined with Panhysterectomy. S. A. Vest and H. H. Curd, Charlottesville, Va.—p. 517.
- End Results of Treatment of Malignant Tumors of Palate. G. B. New and O. E. Hallberg, Rochester, Minn.—p. 520.
- Intrasplenic Epidermoids, Dermoids and Dermal Sinuses. C. F. List, Ann Arbor, Mich.—p. 525.
- Appendicular Obstruction: Its Clinical and Pathologic Aspects. J. J. McCallig, Rochester, Minn.—p. 539.
- Sex Hormone Excretion of Adult Female and Pregnant Monkeys. R. I. Dorfman and G. Van Wagenen, New Haven, Conn.—p. 545.
- Cecostomy. A. W. Allen and C. E. Welch, Boston.—p. 549.

Diagnosis of Chronic Enlargement of Leg.—Luke discusses the numerous causes for the development of an enlarged leg and lists them under six headings: congenital hypertrophy, congenital and acquired lymphatic stasis and obstruction, developmental venous retardation, mixed venous and lymphatic partial obstruction, congenital arteriovenous fistulas and miscellaneous causes. As far as he knows, pure venous retardation as a cause of the condition has not been described. This increased size in a previously unaffected leg is not the same as that due to lymphaticovenous obstruction, in which there is also partial lymphatic blockage. A case is presented which demonstrates that venous retardation can of itself cause enlargement of a leg. The patient had no previous disorder of a leg, phlebitis, pregnancy or any severe illness. The enlargement appeared gradually in early adult life, at a time when defective venous valves in the saphenous system usually appear. Edema as a factor in the enlargement can be ruled out by the absence of pitting on pressure and only a slight diminution in size on prolonged elevation of the leg. Signs of a congenital arteriovenous fistula were not present. The diffuse cyanosis of the leg, most severe on standing, indicated venous congestion, and the absence of enlarged superficial veins ruled out incompetence of the saphenous system; however, this may develop later. Roentgen studies corroborated the clinical impression, in that the absence of valves or defective valves in the deep system of the involved leg were revealed allowing complete retrograde flow. This defect is absent in the normal leg. The hypertrophy of the leg probably resulted from the venous retardation and the prolonged activity of an increased venous pressure over a dilated deep venous bed. The extremity has undoubtedly been endowed with congenitally weaker and fewer valves than the normal leg, and the patient's years of activity as a waitress caused complete defectiveness.

Blood Platelet Count and Coagulation Time.—Potts and Pearl determined the coagulation time of the plasma, with and without platelets, of 52 patients after major operations. The coagulation time of whole blood was also studied. Estimations were made before operation and every day or every other day after operation until the patient's discharge. The average preoperative platelet count was 275,000 per cubic millimeter; on the first postoperative day it fell to 260,000 and remained so until the third postoperative day, when it began to rise so that by the fifth day it was 278,000, by the seventh 292,000 and by the tenth 301,000. By the fourteenth day it fell to 289,000 in the 24 patients who remained in the hospital this long. The average coagulation time of plasma with platelets was constantly practically the same as that of whole blood; except for a slight drop on the first postoperative day neither varied much at any time. The average coagulation time of plasma free of platelets was constantly slightly less than that of plasma containing platelets. There was no discernible relationship between the platelet count and the coagulation time. A platelet count of 120,000 was apt to be associated with a coagulation time of five minutes and a count of 400,000 with a coagulation time of ten minutes; the reverse was just as likely. It seems doubtful that the platelet count and coagulation time following major surgical procedures are of any significance in the development of postoperative thrombosis or embolism.

Uterine Contractions of Early Pregnancy.—Murphy recorded with a Lóránd tocograph the uterine contractions of 250 women between the one hundred and tenth and the two hundred and seventy-ninth day of pregnancy. No spontaneous uterine contraction was noticed until the one hundred and sixty-sixth day, and the expulsive force of contraction increased progressively during the remainder of pregnancy. Patients experiencing uterine contractions prior to the thirty-third week of gestation usually had a significantly shorter labor than those without such activity. Measurement of uterine contractions after the thirty-second week of pregnancy was of no value in predicting the type of labor to follow.

Hepatic Insufficiency in Toxic Goiter.—According to Schmidt and his associates, of 207 consecutive patients with goiter subjected to thyroidectomy 113 presented evidence of hepatic insufficiency as measured by the Quick hippuric acid test. In 34 of these patients the hippuric acid excretion was less than 70 per cent of normal. Hepatic insufficiency appeared related more to the duration and intensity of the thyrotoxicosis than to the type of goiter. Patients receiving specific measures directed at correcting hepatic function showed greater improvement and were better operative risks than a control group of patients treated only by conventional measures. Postoperative morbidity and mortality of severely toxic patients with goiter probably can be significantly decreased by therapeutic measures directed at improving hepatic function. The authors have had only 1 of 370 consecutive patients die after thyroidectomy.

Southern Surgeon, Atlanta, Ga.

10:695-772 (Oct.) 1941

- Multiple Dissimilar Carcinomas of Stomach. R. L. Sanders, Memphis, Tenn.—p. 695.
- Conservatism and Pelvic Inflammation. D. M. Clardy, Hopkinsville, Ky.—p. 705.
- Pathology and Surgical Management of Acute Head Injury. E. S. Gurdjian, Detroit.—p. 711.
- Sulfanilamide in Local Treatment of Traumatic Wounds. R. O. Joplin, Louisville, Ky.—p. 733.
- Role of Fascia in Low Back Pain. J. C. Pickett, Morgantown, W. Va.—p. 738.
- Management of Fracture-Dislocation of Neck. C. P. Graham and J. F. Robertson, Wilmington, N. C.—p. 747.
- Emergency Treatment of Burns. W. C. Tenery and J. H. Tenery, Waxahachie, Texas.—p. 759.

Southwestern Medicine, El Paso, Texas

25:275-310 (Sept.) 1941

- Treatment of Nerve Injuries of Upper Extremities. R. M. Stuck, Denver.—p. 275.
- Relationship of Surgical Immobilization of Both Osseous and Pulmonary Tuberculosis. F. H. Albee, Venice, Fla.—p. 280.
- Recent Developments in Treatment of Urinary Infections. H. F. Hehrholz, Rochester, Minn.—p. 286.
- Flocculation Tests for Syphilis. T. R. Reusser, E. L. Breazeale and J. F. Breazeale, Tucson, Ariz.—p. 289.
- Is Changes in Syphilis: Further Observations. J. T. Lowry, Alamogordo, N. M.—p. 290.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:429-464 (Sept 27) 1941

- Rehabilitation of Injured Air Crews R N Houlding—p 429
Treatment of Hemorrhagic Disease of Newborn A I S Macpherson—p 433
*Causes Underlying Recent Increased Incidence of and Mortality from Tuberculosis in Glasgow S Laidlaw and D Macfarlane—p 436
Avoidable Disability Seen in Recent Amputations W R D Mitchell—p 437
Unilateral Clubbing of Fingers Case with Summary of Literature R E Rodgers—p 439
Procedure for Treatment of Gas Casualties L A Stocken and R H S Thompson—p 448

Causes for Increased Tuberculosis Mortality in Glasgow—According to Laidlaw and Macfarlane, for five years preceding the outbreak of the present war the incidence of and the mortality from pulmonary tuberculosis tended to stabilize themselves in Glasgow at annual figures of around 1,650 notifications and 960 deaths. During the first year of the war the returns were 1,908 and 1,177, respectively. This increase is being maintained during 1941. The increased incidence has taken place almost entirely between the ages of 15 and 45 in males and 15 and 35 in females. The figures for nonpulmonary tuberculosis for 1939 and 1940 also show a considerable rise in notifications and deaths. The possible reasons for the increased incidence are increased virulence of the tubercle bacillus, malnutrition and deficient diet, tubercle bacilli in milk, examination by military medical boards, exertion or strain of army life, long hours in shelters, overcrowding in factories and longer working hours, strain and curtailed rest. A study of these factors shows that a combination of long hours, overtime, strain and ill spent leisure has produced the rise in the number of cases of tuberculosis. The increase will be maintained while these factors remain unchanged.

Journal of Laryngology and Otology, London

56:225-276 (July) 1941

- Protection of Hearing E D D Dickson and A W G Ewing—p 225
Tonsillectomy in Child with Thymic Enlargement R G Macbeth—p 243

Journal of Neurology and Psychiatry, London

4:97-162 (April) 1941

- Alzheimer's Disease with Predominating Crossed Cerebrocerebellar Hemiatrophy R E Hemphill and E Stengel—p 97
*Electroencephalogram in Acute Head Injuries D Williams—p 107
*Electroencephalogram in Chronic Post-Traumatic States D Williams—p 131

Electroencephalogram in Acute Head Injuries.—Williams made electroencephalograms of 74 patients (drawn from a series of 600 patients admitted to a special center for injuries of the head) within twenty days of their injury. The initial electroencephalograms of 42 of the 74 patients were normal, and their subsequent clinical recovery was uneventful. The patients were unselected, and all were members of the army and the Royal Air Force. Their ages ranged from 18 to 60 years. Their injuries varied from simple concussion to severe cerebral laceration with dural penetration and cerebral herniation. Slow waves were invariably present when consciousness was impaired. The degree of abnormality was closely correlated with the clinical state of the patient. In patients with severe injuries the abnormalities persisted for many weeks. The rate of clinical and of electroencephalographic recovery corresponded closely, but there were wide individual variations in the speed of return to normal. In the later stages of recovery the electroencephalogram was sometimes abnormal after the patient had made a complete clinical recovery. Localizing clinical signs corresponded with the area of abnormality seen in the electroencephalogram. An epileptic type of disturbance occurred in the immediate post-traumatic period, but it had no prognostic significance in relation to post-traumatic epilepsy. The author concludes that the electroencephalogram accurately reflects the abnormal cerebral state caused by a recent injury to the head,

that the progressive changes are a direct indication of improvement or deterioration and that in the milder instances of cerebral dysfunction it may demonstrate residual damage after abnormal clinical signs have subsided.

Electroencephalogram in Chronic Post-Traumatic States.—Williams states that the electroencephalograms of the 600 previously mentioned service personnel were taken from a few hours to twelve years after injury. Fifty per cent of the patients had abnormal electroencephalograms. This high percentage persisted for many years after injury. There was a positive correlation between it and the severity of the injury, the persistence of symptoms and dural penetration. Of 87 patients invalided from the services, 67 per cent had an abnormal electroencephalogram. In 207 patients, 55 per cent of whom had abnormal electroencephalograms, the symptoms were thought to be due to organic damage. The electroencephalograms of 37 per cent of 50 constitutionally inferior patients and of 20 per cent of 58 with symptoms due to an exogenous neurosis were abnormal.

Lancet, London

2:359-386 (Sept 27) 1941

- Home Guard Medical Arrangements A L Abel—p 359
*Middle Class Diets in Peace and War E M Widdowson and B K Alington—p 361
Sneezing in Spread of Infection R B Bourdillon and O M Lidwell—p 365
Corrosive Stricture of Stomach Without Involvement of Esophagus C A R Schulenburg—p 367

Middle Class Diets in Peace and War.—From a study of the records of a dietary survey made in 1935 on 63 men and 63 women of the English middle class Widdowson and Alington found that in 1935 the men ate an average of twice as much sugar and bacon, three times as much meat, butter and jam and five times as much cheese as rationing allowed them in the spring of 1941. In 1935 the women ate less of these foods than the men, but the quantities, with the exception of sugar, exceeded the rationing in the spring of 1941. A survey of the diets of 57 middle class women in the spring of 1941 revealed that much less raw fruit and less unrationed meat, fish and sweets were consumed by the women than in 1935. However, milk, bread, cereal foods, potatoes and vegetables were being consumed in larger amounts in 1941. The 1941 survey showed that a prewar level of calories was maintained by the women by substituting unrationed carbohydrate for rationed fat. Their intake of protein, other than animal protein, and of phosphorus was unchanged, and their calcium and iron intake was high in 1941. The average daily vitamin C intake in 1935 was 57 mg. and in 1941 it was 27 mg. The decrease was due to the unavailability of raw fruit.

Medical Journal of Australia, Sydney

2:311-342 (Sept 20) 1941

- Treatment of Thyrotoxicosis S A Smith—p 311
Surgeon's Responsibilities in Thyrotoxicosis H R G Foote—p 313
Radiotherapy in Thyrotoxicosis C de Monchaux—p 316
Technic of Subfascial Thyroidectomy H R G Foote—p 318
Adrenal Cortex A B Corkill—p 324

2:343-374 (Sept 27) 1941

- Hemorrhage Anemia and Jaundice in Newborn F Arden—p 343
Nutritional Anemia in Infancy: Review of 277 Sydney Infants at Age of Nine Months N C Cunningham—p 349

2:375-404 (Oct 4) 1941

- Prevention of War Neuroses W S Dawson—p 375
Psychiatric Practice and Clinical Medicine N V. Youngman—p 378
Causation of Fractures of Neck of Femur E Sandner and E C Thompson—p 383
Aminoplastin in Abdominal Surgery F A Maguire and A R Scott Orr—p 391

Practitioner, London

147:545-608 (Sept) 1941

- Septicemia and Allied Conditions T B Davie—p 545
Medical Aspects of Septicemia C E Lakin—p 553
Surgical Aspects of Septicemia R J M Love—p 559
Puerperal Septicemia R M Corbet—p 562
First Aid in Wounds and Hemorrhage A C W Knox—p 572
First Aid in Asphyxia M M Scott—p 580
First Aid Treatment of Injuries of Eye W J W Ferguson—p 589
Minor Surgery III Minor Surgery of Hand N C Clarke—p 593

Archivos Argentinos de Tisiología, Buenos Aires**17:177-270 (April-June) 1941. Partial Index**

- Amount of Water Vapor Expired in Eupnea and Its Determination in Relation to Clinical Work on Tuberculosis. A. Raimondi and A. S. J. Pena.—p. 177.
- Tuberculosis of Mixed Localization. O. P. Aguilar, G. Sirlin and J. Queirel.—p. 189.
- *Hemorrhagic Pleurisy and Hemopneumothorax. A. A. Raimondi and S. Lerner.—p. 215.
- *Results of Roentgenologic Examination of Attendants of Tuberculous Patients. A. Raimondi, Jr.—p. 227.
- Bilateral Phrenic Exclusion. O. P. Aguilar and C. A. Bancalari.—p. 235.

Hemorrhagic Pleurisy and Hemopneumothorax.—Raimondi and Lerner define those pleural effusions which are red and contain a large number of erythrocytes as hemorrhagic pleurisy. Although the most important causes are cancer and tuberculosis, hemorrhagic pleurisy can be found also in acute rheumatism, typhoid, pneumonia, influenza, syphilis, hepatic cirrhosis, nephritis, malaria, chronic alcoholism and hemorrhagic disorders, such as scurvy, purpura, leukemia and smallpox. The pathologic aspects of hemorrhagic pleurisy are similar to those of serofibrinous pleurisy, with the difference that one frequently encounters abundant proliferation of new vessels and pleural membranes. The increased number of erythrocytes in the effusion is due to such mechanisms as diapedesis and rupture of newly formed capillaries and of fragile walls. The effusion is bright red, but if old it takes on a violet color. Cancer is the cause so frequently that whenever hemorrhagic pleurisy exists it is necessary to employ all diagnostic aids that will eliminate cancer as a possible cause. Hemorrhagic pleurisy can supervene in patients with cancer of the stomach, the uterus, the breast and so on, and it may indicate that metastasis has taken place. When it is the first sign of cancer, two possibilities must be considered: (1) that hemorrhagic pleurisy may mask a tumor which, after the evacuating puncture, can be easily recognized clinically by various forms of roentgen examination and bronchoscopy; (2) that hemorrhagic pleurisy may be symptomatic of primary cancer of the lung or the pleura, in which case the clinical difficulties are great. Tuberculosis is the other frequent cause of hemorrhagic pleurisy. It may be primary or secondary to acute or chronic pulmonary tuberculosis. In order to characterize hemorrhagic pleurisy as tuberculous and primary, the following conditions must be fulfilled: (1) absence of tuberculous lesions, (2) presence of tubercle bacilli and (3) appearance of tuberculous lesions immediately after production of the effusion. On the basis of these conditions primary tuberculous hemorrhagic pleurisy is extremely rare. Secondary tuberculous hemorrhagic pleurisy is more frequent than the primary form. It may occur in acute forms (miliary tuberculosis, caseous tuberculosis) or in chronic forms. When accompanying the acute forms, it is frequently bilateral and characterized by intense dyspnea and a rapidly fatal evolution. When secondary to chronic pulmonary tuberculosis, the development is determined by the pulmonary status. Hemorrhagic pleurisy may supervene after suspension of artificial pneumothorax. If it takes a benign course, the treatment consists in the evacuation of the effusion with or without reinsertion of air. The malignant form, which is less frequent than the benign, is produced when a subpleural tuberculous lesion opens into the pleural cavity. In this condition, thoracoplasty seems to be the only therapy likely to prevent a fatal outcome. Discussing spontaneous hemopneumothorax, the authors show that hemorrhagic pleurisy is customarily not an inflammatory condition but a hemorrhage accompanying spontaneous pneumothorax. Both the tuberculous and the nontuberculous forms of spontaneous hemopneumothorax are rare. They encountered only 3 cases in 94,914 case records.

Roentgenologic Examination of Attendants of Tuberculous Patients.—Raimondi made periodic roentgen examinations of 341 persons who lived in an environment where they were exposed to tubercle bacilli and found that 21 per cent had mild or grave forms of tuberculosis. The majority began with a form of tuberculosis that presented no symptoms or only slight symptoms. The incipient lesions are tractable to treatment; success is often obtained with ambulatory treatment. It is essential to convince persons who live in the environment of

patients with open pulmonary tuberculosis of the necessity of periodic roentgenologic examinations, because, although subjective symptoms may be absent, pulmonary lesions may at times advance unnoticed. Periodic examination will insure diagnosis when the disease is in the incipient phase, so that it will be possible to institute effective treatment. The author calls attention to the relative frequency with which hematogenic forms are encountered in adolescents and young adults who are exposed to infection. On the basis of statistical studies and of several observations the author supposes that exogenous reinfection is of importance in the genesis of the disease.

Tokyo Igakkwai Zassi, Tokyo**55:529-620 (July) 1941. Partial Index**

- *Histopathologic Studies of Diabetic Kidneys with Special Reference to Changes in the Glomeruli. R. Murakami.—p. 529.

Glomerular Pathology in Diabetes.—Murakami made histologic studies of kidneys in 27 cases of diabetes mellitus, including 7 instances of death resulting from acidotic coma, with special reference to the changes demonstrable in the glomeruli. The most striking changes in diabetic kidneys were found to be enlargement of the glomeruli due to both regressive cellular swelling of the basement membrane and progressive hypertrophy and hyperplasia accompanied by hyperemia. Hyalinization, fibrotic union of capsules and fatty and glycogen degeneration of the parenchyma were also noted. All these changes in some instances at least appeared to be reversible, paralleling the clinical course in each case, but parenchymatous degeneration was not clearly demonstrable in cases of acidotic coma or of renal complications. Although the pathologic changes of the diabetic kidney resemble those seen in nephrosclerosis, the two conditions can be cytologically differentiated. The changes may be regarded as a cumulative product which is compensatory to functional disturbances, caused by the stimulating effect of overfunctioning organs and of tissues saturated with the abnormal composition of the urine. The predominance of these changes occurring in the glomeruli and the terminal capillaries may be due to the chief excretory function which these tissues perform, together with the contributory effect of the specialized structure of the glomerular tufts. The appearance of epithelial cells at the end of the Bowman capsule is probably but an extension of the main epithelium. Although there is no direct evidence of any organic relation between this disease and other lipemic diseases, yet the abnormal enlargement of the glomerular tufts may aggravate the lipemic kidney and accentuate the existence of such diseases by epithelial hypertrophy. The diabetic kidney may thus be regarded as representing a case of glyconeuphrosis under the general category of glomerular nephrosis.

Ugeskrift for Læger, Copenhagen**103:1201-1230 (Sept. 18) 1941**

- Advances in Operative Treatment of Recent and Older Fractures of Neck of Femur, Especially Personal Experiences with Lindén's Percutaneous Method. K. Lehmann.—p. 1201.
- Conditions Concerning Abdominal Rigidity, Especially in Acute Appendicitis. O. Raagaard.—p. 1208.
- *Changes in Visceral Blood Vessels in Thromboangiitis Obliterans (Buerger). G. Teilmann.—p. 1211.
- Dyscraniodyspthalia: Case. T. Grinsted.—p. 1215.
- Treatment of Scabies with Dioxanthogen Petrolatum. H. Haxthausen.—p. 1217.
- Cases of Hemorrhage in Peritonitis Abscess. T. Krarup.—p. 1219.

Visceral Blood Vessels in Thromboangiitis Obliterans.—Teilmann reports a case of severe thromboangiitis obliterans in a man aged 43 with gangrene of both lower extremities. Necropsy showed, besides the characteristic changes in the arteries of the extremities and of the pelvis, (1) thickening of the intima and obliteration of the peripheral part of the main descending branch of the coronary artery, with corresponding thickening of the intima and more peripherally almost complete obliteration of the afferent arterial branch. This, together with a few similar observations previously published, supports the assumption that in Buerger's disease there is a general disturbance of the arterial system.

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The Future of Pediatrics

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DURHAM, N. C.

Although pediatrics is one of the oldest of the clinical specialties, dating from Bagellardus, Metlinger, Phaer, Hieronymus, Sainte Marthe and Glisson (1453-1600),¹ it is only in recent years that the growth has been rapid, owing in no small part to a demand on the part of the public for better medical care for the child.² This same demand is leading to more intensive development of child health activities on the part of the state and to the acceptance of the ideas that the health of the child is a responsibility of the government somewhat analogous to the way in which education has been a state responsibility and that, if the American child is entitled to an education, he is entitled to health.³ At present pediatrics, through its own commendable efforts in prevention³ and also for economic reasons, may lose its strictly clinical aspect and become increasingly merged with preventive medicine and public health. In fact, the pediatrician is fast becoming a liaison officer between the public health service and private medicine.⁴

There are four reasons for this trend: (1) the advances in preventive pediatrics, (2) the nature of pediatric practice, (3) the increasing number of pediatricians and (4) the improved pediatric training of general practitioners.

1. The advances in preventive pediatrics, most of them made by pediatricians themselves, have eliminated many of the pediatric problems, so that the need for practicing pediatricians is decreasing. A generation ago the majority of patients were children. Now ill children are in the minority because (a) diphtheria, whooping cough, dysentery and typhoid are becoming rarities, (b) pneumonia, meningitis and dysentery are successfully treated with sulfonamide derivatives, (c) congenital syphilis is reduced through more adequate treatment of pregnant women, (d) infant feeding is simplified⁵ and nutritional knowledge increased, (e) the mortality in children has decreased 66 per cent and (f) the ratio of children to the total population is reduced from 1:3 to 1:4 as the result of the falling birth rate and the increased longevity of adults.⁶ However, the need for continued and improved preventive pediatrics cannot be overemphasized; 75 per cent of the deaths among children are preventable, and it is in this field, as well as in practice, that pediatricians always will be needed. More and better research on the cause, cure and prevention of children's diseases, in addition to greater stress on preventive pediatrics, also is necessary.

2. Pediatrics is essentially general practice limited to the care of children from birth or even before birth to or through adolescence⁷ and therefore pediatricians are in constant competition with other specialists, health and infant welfare agencies and with general practitioners, for "the majority of the children in this country are cared for by general practitioners and not by pediatricians."⁸ Furthermore, the percentage of graduates who are going into general practice apparently is increasing.

3. At present there are 4,205 pediatricians—2,205 full specialists and approximately 2,000 partial specialists—of whom 1,620 have been certified by the American Board of Pediatrics.⁹ It is possible that the opportunity for successful pediatric private practice may be lost because of a supply greater than the demand.² It is doubtful whether the public can support a larger

From the Department of Pediatrics, Duke University School of Medicine and Duke Hospital. Read before the eighty-seventh meeting of the Medical Society of the State of North Carolina, Pinchurst, N. C., May 15, 1940.

1. Ruhräh, John: *Pediatrics of the Past*, New York, Paul B. Hoeber, 1925; Davison, W. C.: *The Future of American Pediatrics*, J. Pediat. 14: 810-814 (June) 1939.

2. Veeder, B. S.: *The Position of Pediatrics in the Present Day Practice of Medicine*, Pennsylvania M. J. 44: 1233-1239 (July) 1941.

3. Davison, W. C.: *Preventive Pediatrics*, J. A. M. A. 114: 712-716 (March 2) 1940.

4. Evans, C. A.: *What Has Pediatrics to Offer?* Medical Economics 18: 40-44, 92-98 (May) 1941.

5. Student song on simplified feeding with evaporated milk: "No teats to pull, No dung to fling, Just punch two holes In the Goddam thing."

6. Davison, W. C.: *Opportunities in the Practice of Medicine*, J. A. M. A. 115: 2227-2232 (Dec. 21) 1940. Veeder.²

7. Davison, W. C.: *Pediatrics: What Is It?* J. Pediat. 3: 61-77 (July) 1933.

8. Council on Medical Education and Hospitals of the American Medical Association: *Medical Education in the United States, 1934-1939*, Chicago, American Medical Association, 1940.

9. Veeder.² Evans.⁴

number of pediatricians, as half of the babies born each year are in families on relief or with an annual income of less than \$1,000. Fair remuneration to the physician is essential to good care.² As the average age of the practicing pediatrician is approximately forty years and replacements will be slow, graduates of today who wish to care for children may have difficulty as specialists and probably should enter general practice or obtain health department positions, even though this statement may be interpreted as a lamentation of Jeremiah or a tribulation of Job.

4. The improved teaching of pediatrics in the medical schools has enabled many of the present graduates who are going into general practice to have a more practical knowledge of pediatrics than some of the interns in the children's hospitals had a generation ago.² In addition, the increased number of pediatric internships has made postgraduate pediatric training available for general practitioners. Twenty years ago almost all pediatric interns went into pediatric practice, but during the past ten years 40 per cent of those at Duke Hospital have gone into other fields.

In spite of these trends in pediatrics, some practicing pediatricians always will be needed, as the clinical problems of children differ from those of adults.¹⁰ Pediatric teachers and members of state and federal health organizations also are necessary in order to perpetuate and increase the advances made in preventive pediatrics.³ Most of the present American pediatricians are maintaining successful practices, particularly those who emphasize preventive measures and include child guidance, mental

hygiene and adolescent care in their field.¹¹ The small to medium sized cities are the best places in which to practice, as the larger cities are oversupplied with specialists and the small towns can seldom support them. Low fees for prophylactic measures, which are given free by health departments, and agreements with a family to render pediatric services for an annual fee have been helpful, i. e. full service of unlimited office and home visits and immunization for \$60 to \$85, or well baby service of office visits and telephone calls but not home visits for \$35 to \$80.

The problem of pediatric instruction in medical schools has therefore changed; in 1930 it consisted in teaching pediatrics to medical students, most of whom planned to enter some specialty, and the provision of postgraduate training, through internships and residencies, for future pediatricians. Now the latter are decreasing, but a greater need has arisen—the laying of a sound foundation for every student's development in pediatrics, especially in the care of newborn infants, as 40 per cent or more may go into general practice, and short intensive pediatric courses for physicians who have been in general practice for several years. Duke University's answers to these new demands are a heavy pediatric teaching schedule (two hundred and seventy-nine hours), pediatric internships and residencies, obstetric-pediatric internships and weekly obstetric-pediatric postgraduate courses for general practitioners, sponsored by the North Carolina State Board of Health, the U. S. Children's Bureau and the University of North Carolina School of Public Health.

Digests and Reviews

PERSONALITY IN PRACTICE

Abbreviation of an address to the graduating class by Dr. Louis J. Karnosh, of Western Reserve University School of Medicine, Cleveland, June 11, 1941, published in the Clinical Bulletin of that school in September.

What you have achieved today places you in a unique category which you will more keenly appreciate through experience. An analysis of the bibliographic indexes published in this country reveals that the probabilities of your becoming distinguished by virtue of being a physician are five times as good as they are for a lay or nonprofessional person. This implies great expectations, but by the same token it also implies that a stark failure among you is all the more glaring.

Despite the fact that you are now marked men and women, the distinction you are acquiring today is in a sense an artefact. The class of 1941 remains as a vertical sampling of normal human nature. The degree of Doctor of Medicine does not restratify, neither does it stereotype your individual personalities. The same proclivities and dispositions which were in part displayed in your freshman aptitude test, which were exposed as the unguarded mannerisms of the classroom and which more freely exude from you in the informal atmosphere of the fraternity house or dormitory, will still guide and propel you in definite directions. These make for the prime differences which exist among physicians—no more, no less than they do among stock brokers or laborers or members of the Thursday lunch club.

10. Sweet, Clifford: Opportunities in Pediatric Practice, J. A. M. A. 111: 893-897 (Sept. 3) 1938. Veeder.²

11. Casparis, Horton R.: Some of the Preventive Aspects of the Mental Health Problem, J. A. M. A. 106: 2207-2209 (June 27) 1936.

A SORT OF INTELLECTUAL FANATICISM

I should like to speak of virtues which, because they are virtues, may be allowed to grow on one to the point of becoming unbecoming and disabling. I shall speak first of those among you who are the factualists and precisionists in medicine. You represent the heart of medicine, without which there can be no supporting frame or structure. Your ultimate criterion is the test tube, your senses are tuned to a cold objectivity, and the ailing body is a synthetic mass of malfunctioning organs. In your tower of crisp calculations you make invaluable deductions, but your precisionism is sometimes acquired at the cost of an appropriate sense of humor. Patient with all other facts in medicine, you may find yourself impatient with the fact that the ailing person stubbornly insists on being emotional and sentimental. You can't count on him as you can on the Bence Jones protein reaction. Cold objectivity has its place in the ivory tower, but at the bedside it may become a piece of clumsy grotesqueness. The distinction between a human being and a guinea pig becomes wider and wider the more remote in recollection become your experiments in the laboratories of the medical school.

The pursuit of a specific item by a method of precision and the feverish desire to apply it to the humanities may often become a sort of intellectual fanaticism. This is well demonstrated in the case of Bischoff, one of the leading anatomists of Europe, who thrived some seventy years ago. He carefully measured brain weights, and after many years' accumulation of much data he observed that the average weight of man's brain was 1,350 Gm., that of a woman only 1,250 Gm. This at once, he argued, was infallible proof of the mental superiority of men over women. Throughout his life he defended this hypothesis with the conviction of a zealot. Being the true scientist, he specified in his will that his own brain be added to his impressive collection. The postmortem examination elicited the interesting fact that his own brain weighed only 1,245 Gm.

It is well to develop the hard sheen of scientific exactness in the laboratory; it is just as important that in the clinic and the sickroom this surface be polished to a softened and velvety patina. The addict to exactness must be frequently reminded that in the art of medicine a sick patient who gets well without a diagnosis is better off than a dead one with a complete pathologic report.

Second, there is the classmate among you with the encyclopedic mind. It is often announced by a jeweled display athwart the vest buttons. You are hailed as a ready reference system which forestalls the need of frequent visits to

the library—in short, a walking bibliography. Of you we can never be too proud, provided all your other sensitivities are equally astute, especially the nerve endings in your finger tips, and provided your lingual muscles are not over-exercised at the expense of those in the forearm and hand. Yet, if you are so blessed, your virtues are tempered by certain unfavorable drifts. Pedantry and peripatetism are your trends, which is another way of saying that at times you may become an awful bore.

There is a temptation on the part of the encyclopedic medical mind to feed too much on the rarities and unique syndromes. It is above the common cold and simple constipation. It should live on simpler fare. It is too fond of wandering into obscure entities and diverticula, where it loses itself in a maze of didactics. This often exposes it to ideas and medical vogues which are new but not true; a reputation built up by exploiting them may go up with the rocket but may also come down with the stick. The encyclopedic mind holds too many "dry clinics" which soon develop into sterile husks of medical thinking and reasoning. Hold more steadily to the homely values of simple judgment and practical insight if you are encyclopedic. Resist the temptation to dys-intellectualism, refrain from looking down your intellectual nose; avoid picayune argument; avoid the tendency to show the supercilious stance and to accuse dissenters of "intellectual dishonesty." This is a self rationalization which may degenerate into a cheap and pathetic pose.

We now come to a third and most familiar proclivity—the classmate who by the grace of God and not by reason of having taken a course in psychobiology is endowed with a ductile ease in getting along with people. If you are so gifted, you are blessed with a rich intuitive knowledge of human nature and a reflex-like facility in saying the appropriate thing at an appropriate time. So potent are these values that they have made some men of medicine demigods. But let them not be matched grain for grain by an equal weight of factual knowledge and they develop fatal toxic properties, making of men conceited fools and dangerous buffoons.

If you are of this ilk, a loose empiricism in practice is your greatest temptation. It's so deadly easy to rely on the oily word and the light touch of a solicitous hand, to bank on too much intuition. So easy to gravitate without too much strain of the conscience into that dangerous borderland between a flimsy empiricism and a frank charlatanry. Less excusable is your position than that of the quack, for unlike you he cannot conceal his lechery behind the robes of legitimate medicine.

A HAPPY BLEND OF HUMAN INGREDIENTS

Over in the corner and probably in the back row, unless you are alphabetically arranged, is the modest, level, plodding member of the class, who is perhaps a little lusterless but who studies quietly and passes his courses without fanfare or scintillation. His tempo, perhaps, is a little slow but it is steady. There are no spurts of brilliance, neither are there demonstrations of failure. Call him average, if you will, or even worse: he will continue his even mien through a prescribed routine. In some quiet by-way or in a village street you will shortly see his name plate. Not enough has been written about the average man. Pray, where would be the brilliance and erudition of great clinicians and teachers if these could not be contrasted against a somber setting of substantial, average men who practice medicine in an average town in an average way? Take heart, if the world stamps you as average, for if your virtues are not strongly positive then it follows that your weaknesses are likewise bland and forgivable.

In substance I do not believe that the class of 1941 possesses some of the startling hybrids I have just described. Yet these trends are there to some degree. I know that you are a happy blend of human ingredients wherein every good attribute is made stronger by reason of its constant tension with an undesirable one. Like carbon in steel, your weaknesses will give tensile strength to character.

If you truly believe that here, today, you begin to be what you are to be forever, how absorbing and fascinating will be your prospects! Give the lie to the claim that physicians so drug themselves with the routine of the sickroom that they become inarticulate in the drawing room. Conversation is a traffic and, if you enter it without some stock of knowledge, the trade drops off. To obtain knowledge, one must read. The physician, if his reading time is restricted, should by preference read the newest works in science, in literature the oldest. New books revive and redecorate old ideas; old books suggest and invigorate new ideas.

INCENTIVES AND REWARDS

Money, gratitude and technical success cannot be your only awards. Education, philanthropy and industry are deeply tinged by medical analogies and medical ideals. The newspapers are full of medical items and articles. Almost any medical book can get itself published. It is fair to say that no other profession excites today so large a measure of public interest in all classes. On this wave of public interest the medical profession is riding either for good or for evil result. To keep medicine in fashion it must continue to merit the public sympathy and approval. We charge you to strengthen your resolves and sharpen your wits to keep it so.

INTERN LABORATORY EDUCATION
IN THE GENERAL HOSPITAL

Condensation of a paper by Herman H. Van Horn, M.D., published in the Pennsylvania Medical Journal, November 1941, page 136.

The intern who comes to us in July for one year of postgraduate work is not a usual person. He is one of six thousand a year from a population of one hundred and forty million. He has an unusual background. He is a product of one of the most high pressured educational institutions in the world—the American medical school. For eight years since high school he has been in training, his instructors have included leading men of the country in medicine and surgery and, incidentally, his expense has amounted to several thousand dollars.

Moreover, this postgraduate student has a historical background as striking as any other portion of all educational history. In the last quarter of the nineteenth century microbiology was born and modern medicine became a fact. Laboratories, microscopes and full time instructors became essential factors in the modern advance. Then from 1900 to 1910 a cyclone of reformation struck the medical schools of this country, and those which survived began a remarkable metamorphosis into the powerful educational units that they are today. Also in that first decade of this century came the Council on Medical Education and Hospitals, which in 1904 inaugurated the intern year in the general hospital. Thus the general hospital was drawn into the picture, and to it was added an educational function. Today, if a general hospital is fortunate enough to be on the relatively small approved list of teaching hospitals, a large and definite educational responsibility is placed on its doorstep each year in July when the interns arrive. The nature of this responsibility has been well analyzed in THE JOURNAL by Nathan Smith and placed squarely where it belongs—on the shoulders of two groups: (1) the hospital administrators and (2) the members of the staff.

I can speak only for the course in laboratory education. I believe that it is well at the beginning of the year to file with the superintendent a written outline of what I hope to teach the intern and how I expect to do it. This is of interest to the superintendent and also tends to clear the matter in my own mind.

The aim of this course is to produce a physician so trained by his eight weeks in the laboratory as to be truly skilful in the laboratory part of his diagnostic work. The aim is to avoid a gap between the future physician and the laboratory, which he will so much need at the future time. In this course he will be taught a knowledge of some forty-five fundamental tests and will do them so frequently that they

will become a part of his equipment. He will learn the value of laboratory tests in their true perspective and not expect them to take the place of history, inspection, reflection, palpation, auscultation and percussion. He will learn to order the tests which are diagnostic rather than those of slight or remote scientific interest. He will learn that orders for laboratory work should come when and only when the history and physical examination are fresh in mind and call specifically for this or that test. He will learn that negative results from laboratory work are of little value and may sometimes be ignored in the face of other evidence. He will learn to reorder at proper intervals those tests which are helping to check the clinical changes in his patient. He will also learn that laboratory tests cost some one labor, time and material, have definite economic value, and must be paid for by his patient even as his medical bill must be paid. This will deter him from unnecessary expense to his patient. He will learn to use simple tests rather than complicated ones, when just as much can be learned from them.

To work out a method to attain this high aim and do this work in eight weeks is no mean problem. After talking with other pathologists, I discovered a teaching method being worked out in 1940 by a pathologist who felt as I did and who was introducing it in a teaching hospital in New York. This method appears to me as ideal as possible for this work in this period of time. There are four points in this method:

A separate work space must be provided for the intern and adequately equipped for his procedures. This may be known as the intern laboratory. If an entire separate room is not available, a corner of some other room can be utilized and complete equipment installed. This can be done at an expense of about \$400, and in 35 square feet of space. Such a laboratory can readily be created in any teaching hospital. I used a corner of a room adjoining my main laboratory. This assures the intern privacy and a chance to think. It also definitely avoids confusion in the main laboratory, where every one is busy.

We proceed in this course to give the intern during the first one of his eight weeks a working acquaintance with forty-five of the most fundamentally diagnostic tests that are done in a clinical laboratory. We ask him to bring to us on his first day in the laboratory a list of the

tests which he has learned in his medical course and which he feels competent to do. This list may be short—mainly blood counts and urinalyses. This does not matter. A technologist is assigned to introduce him to his laboratory and equipment and check with him on the tests he has already done to find if his technic can be improved. He is then given a list of forty-five tests by the pathologist, who discusses these tests with him and explains more fully the nature of this course. With the aid of the technologist these tests should be done by him, some six or seven a day during the first week. There is no doubt that this will be a busy week for him and will take most of a technologist's time, but it can readily be done.

Having thus refreshed his mind as to laboratory tests and technical methods, the following seven weeks are utilized as follows: From ward patients in various services a list is selected. As far as laboratory work is concerned, these will be his own patients. The list may be made small or large but should be as large as his time will permit. All orders on these patients will be given to him as soon as received in the laboratory. He will learn to know these patients and to do and report whatever laboratory work is requested on them at any time. He may also do other tests on them if he is so inclined. Thus for seven weeks he will be correlating laboratory tests with individual patients. Findings and diagnoses as well as surgical specimens will be discussed with the pathologist, other interns and staff men in the services. This follows and continues the educational principle of correlation, which was the basis of all his various clerkships in medical school.

Beyond this main line of work covered by the preceding three points there are a variety of special procedures for which the laboratory intern will find time as the occasion arises in ward cases. He will do lumbar punctures, gastric studies, duodenal drainage, blood transfusions and studies in allergy. He will do the current autopsies, under supervision, and with special reference to routine sequential procedure and thoroughness. He will study microscopic preparations from the autopsies and will study gross and microscopic surgical specimens. He will also be asked to prepare and present specimens at clinical conferences. He also should keep a list of all the work he does each day for summarizing at the end of his course.

DO YOU KNOW WHAT PHYSICIAN—

1. Was the first physician in New England arriving on the Mayflower?
2. Was the first to practice midwifery in America on a scientific basis?

3. Was the author of the first publication on a medical subject in America?
4. Was a famous explorer?

(The answers are on page 2290.)

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items for consideration for publication in the Student Section.

Joint Meeting of Association of Medical Students and the Intern Council of America

The Association of Medical Students and the Intern Council of America will hold their annual meeting jointly at International House, University of Chicago, December 27-29. The general theme of the meeting will be "Health and the Defense of the Nation." Among the speakers will be Drs. Morris Fishbein, Chicago, editor of *THE JOURNAL*; William D. Cutter, Chicago, secretary of the Council on Medical Education and Hospitals; Fred C. Zappfe, Chicago, secretary of the Association of American Medical Colleges; Victor Johnson, dean of the University of Chicago College of Medicine; Charles S. Bacon, professor emeritus of the University of Illinois College of Medicine, Chicago, and Henry Sigerist of Johns Hopkins University School of Medicine, Baltimore.

Yale Increases Elective Hours of Study

On recommendation of the committee on program and policy, Yale University School of Medicine, New Haven, Conn., has revised the curriculum by establishing a two to one ratio between required and elective hours of study, so that about eight hundred hours a year will be allotted for required work and four hundred hours for elective work. The required courses will be held in the mornings only during the first two years of study, leaving all the afternoons free for elective courses. The number of hours of required work in the medical school mounted steadily for the past ten years until the time left for elective courses was less than one hundred and sixty hours for freshman and sophomore students and no time for third year students unless they voluntarily remained in school through the summer. Dean Francis G. Blake of the school of medicine, according to the *New York Times*, said of the foregoing change that "the revision of the curriculum is a reaffirmation and a further elaboration of the liberalized educational program which was initiated at Yale in the early 1920's and based on the fact that the medical student as an adult already has embarked on his life's work and therefore must learn both to pilot his own boat and assume largely the responsibility for acquiring that content of knowledge which is necessary in charting his future professional course. Dr. Samuel C. Harvey, professor of surgery at Yale and a member of the committee on program and policy, said that the formal lecture had decreased in importance in recent years because of the abundance and excellence of printed texts and that the lecture probably should be limited to work not yet available in printed form.

University of Kansas

Lewis L. Coriell '42 has been awarded the \$300 Porter Scholarship for 1941-1942 at the University of Kansas School of Medicine, Kansas City. The award is granted each year to the senior student with the leading scholastic record.—Francis O. Trotter Jr. '42 has been awarded the \$100 A. Morris Ginsberg prize in medicine. This award is made annually to the student who shows the highest proficiency in the medical courses of the junior year. The medical students were the guests of the local chapter of Phi Beta Pi at the annual fall medical school party at the Ambassador Hotel, Kansas City, October 8.

Minnesota's Incus Society

At the annual initiation banquet of the Incus Society, an undergraduate medical group at the medical school of the University of Minnesota, Minneapolis, Dr. Harold S. Diehl, dean and professor of preventive medicine and public health, and Dr. John C. McKinley, professor of medicine and nervous and mental diseases, gave addresses on the proposed revision of the junior and senior curriculums. The plans of the Incus Society for the year include (1) publication of a student section of the Minnesota Medical Foundation *Bulletin*, (2) symposiums on national defense, tuberculosis and the specialties, (3) the furtherance of closer student-faculty relations.

Names of British Medical Students in American Schools

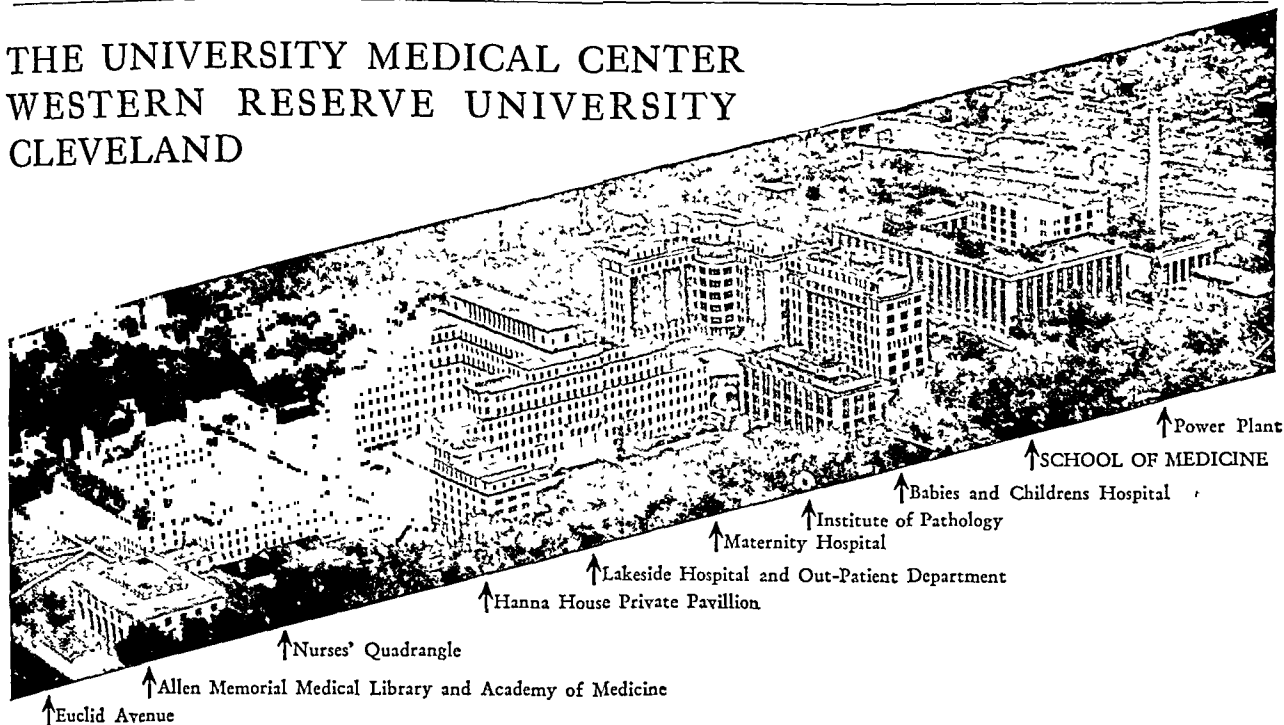
Bombing attacks on London and other cities of the British Isles have damaged medical schools and hospitals in which medical students have received their clinical training. In order to help British medical students to continue their studies, the Rockefeller Foundation has created a number of studentships which provide for tuition and other instruction fees and living costs for a period not to exceed three years. Recently twenty-five British medical students were selected from a list of about one hundred to pursue their studies in medical schools in the United States and Canada. The students were chosen by a special committee in England, of which Sir John Stopford, vice chancellor of the University of Manchester, is chairman. These students are all British citizens and expect to return to the British Isles at the termination of their training. The names of the students and the medical schools at which they are now studying follow:

NAME	SCHOOL
Badenoch, John	Cornell
Bartley, Christopher W.	McGill
Cadman, Ewan F. B.	Washington (St. Louis)
Davies, Jack	Iowa
Edwards, David A.W.	Michigan
Gibson, James B.	Western Reserve
Gosling, Robert H.	Cornell
Gray, Ian R.	Wisconsin
Hare, Patrick J.	Johns Hopkins
May, Philip R. A.	Stanford
Newton, Michael	Pennsylvania
O'Hea, Matthew A.	Washington (St. Louis)
Pond, Desmond A.	Duke
Rankine, George	Duke
	Chicago
	Rochester
	Yale
	Johns Hopkins
	Harvard
Shillingford, Jack P.	Minnesota
Stephen, James D.	Harvard
Stowers, John M.	California
Swyer, Gerald I. M.	Pennsylvania
Tanner, James M.	Toronto
Todd, Ian P.	Yale
Turner, Robert	

Georgia Student Council

The Faculty-Student Council of the University of Georgia School of Medicine, Augusta, held its first meeting of the year, November 17, at the home of the dean, Dr. G. Lombard Kelly. It was reported that the hospitalization insurance plan instituted at the school last year had proved successful so far, the individual charge of \$2.50 taking care of all student hospital bills and leaving a small surplus.

THE UNIVERSITY MEDICAL CENTER WESTERN RESERVE UNIVERSITY CLEVELAND



Western Reserve University

Western Reserve University School of Medicine, Cleveland, controls for teaching and investigation purposes the clinical material of several hospitals whose bed capacity totals 2,600 and whose dispensaries are attended by 40,000 persons a year. The number of medical students at Western Reserve at present is 294. The school has graduated a total of 3,799 students "in course" and the schools which were consolidated with it graduated 1,218 students. The school of medicine of Western Reserve University was organized in 1843 as the Cleveland Medical College in cooperation with Western Reserve College; it is supported largely by endowment and special contributions, the income from tuition and fees covering but a minor part of the current budget. When the developments of medical science made the old building inadequate and accentuated the importance of close proximity to the other departments of the university, there evolved the conception of a university medical center, situated on the university campus and including not only the school of medicine with a group of university hospitals and clinics but the schools of the allied professions of nursing, pharmacy, dentistry and applied social sciences. In 1915 about 20 acres of land was secured for the medical center and since then the various buildings illustrated have from time to time been erected. While Mr. Samuel Mather and the General Education Board of the Rockefeller Foundation made magnificent contributions, it is interesting that many of the new buildings in the medical center were provided for by public subscription.

Effective July 1, 1940 the Lakeside Hospital, the Babies and Children's Hospital and the Maternity Hospital consolidated as University Hospitals of Cleveland. While the Rainbow Hospital for Crippled and Convalescent Children remains a separate institution, it also is operated by University Hospitals. In addition to the hospitals in the medical center, the university has control of the clinic material at the fifteen hundred bed Cleveland City Hospital, at the three hundred bed St. Vincent Charity Hospital and at the Ohio State Hospital for the Insane in Garfield Heights.

Western Reserve University School of Medicine is now the legal successor to all the regular medical schools that have existed from time to time in Cleveland, including the medical department of Wooster University, the medical department of Ohio Wesleyan University and Charity Hospital Medical College. Admission to the school is restricted so that the number of students in the upper classes ordinarily will not much exceed sixty. The total necessary expense, exclusive of tuition and fees but covering books and instruments, board and room, for thirty-four weeks need not, according to the official bulletin of the school, exceed \$600. The outlay for clothing, traveling expenses and incidentals depends on the student. A deposit of \$100, one fifth of the tuition of the first year, must be made by the applicant when he definitely accepts a place in the school, and this deposit is applied to the first payment on tuition if the student matriculates. The library, fellowships, loan funds, prizes, lecture foundations, student health service and many other facilities at the school are described in the November 1 issue of the *Bulletin* of the Western Reserve University School of Medicine.

Commencement Prizes at Washington University

At the 1941 commencement at Washington University School of Medicine, St. Louis, the following prizes were awarded: George F. Gill Prize in anatomy, \$50, to Bryce Harold Bondurant; George F. Gill Prize in pediatrics, \$50, to Jane Aral Erganian; Alpha Omega Alpha Book Prize to Leon Kahn; Howard A. McCordock Book Prize to Raymond Ray Lanier Jr.; Alexander Berg Prize in bacteriology, \$100, to Herman Theodore Blumenthal and Hyman Bernard Stillerman.

The Alumni scholarship for the school year 1941-1942 has been awarded to Donald Huelsmann; the T. Griswold Comstock scholarship to Raymond F. Rose; the Andrew R. and Susie Fleming Fund award to Jean R. Boyle; the George F. Gill scholarships to Edward W. Czebrinski and Harold Grant; the Williams McKim Marriott Memorial scholarship to William J. Davis; the Eliza McMillan scholarship for women to Dorothy Reese; the LaVerne Noyes scholarship to Saul D. Silvermintz; the Robert Allen Roblee scholarships to

Robert E. Holt Jr. and Helen C. Reller; the Jewish Women's scholarships to Bernard Bressler and David Feldman, and the John B. Shapleigh scholarship to John H. Eisenhauer.

Two British medical students were admitted to the third year class as Rockefeller Foundation scholars. They are Ewan F. B. Cadman of Southport, Lancashire, England, and Matthew O'Hea of Wishaw, Scotland.

Northwestern

The annual Founder's Day Lecture at Northwestern University Medical School, Chicago, was given this year on October 7 in honor of Dr. Irving S. Cutler, the retiring dean. The new dean, Dr. James Roscoe Miller, gave the address which expressed for the school its appreciation of the work and life of Dr. Cutler, on whom at this occasion the president of Northwestern University conferred the degree of Doctor of Science. The faculty presented to Dr. Cutler a book containing the signatures of all its members and a message of gratitude.

A new course entitled "Military Medicine" has been added to the senior year; four lectures will be given by officers of the army and navy and twenty-eight lectures by specialists at Northwestern University on medicomilitary problems.

Student Clinic Day at Wayne

Regular classes were dismissed to permit students, faculty and alumni to participate in the fourth annual Student Clinic Day at Wayne University College of Medicine, Detroit, December 12. The students were in charge in the clinical sessions on heart sounds, high blood pressure, the electrocardiograph and contagious diseases. The general chairman was junior student Wellington B. Huntley. The program began at 8:30 a. m. and continued throughout the afternoon. Cash prizes and medals were awarded to the students who contributed outstanding papers or clinical leadership to the day's program. At the dinner meeting in the evening at the Wardell Hotel, S. L. A. Marshall of the *Detroit News* spoke on "The War Today." Other dinner speakers were Dean Edgar H. Norris, M.D., and Associate Dean William J. Stapleton, M.D.

A. O. A. at New York University

Under the auspices of the Delta chapter of Alpha Omega Alpha, Dr. William C. Stadie, associate professor of research medicine at the University of Pennsylvania School of Medicine, discussed fat embolism in diabetes mellitus on October 31. After the lecture the following newly elected members of the society were welcomed: Class of 1942: David A. Dreiling, Saul J. Farber, Arnold W. Friedman, Robert M. Gabrielson, Irma H. Gross, Carol K. Smith, Harvey P. Kopell, Harold Lief, Doris H. Milman, Alice E. Moore, David F. Sunkin; Class of 1943: Ernest Cottle, Jerome Seides, Leon Sokoloff.

The Agramonte Manuscripts at Louisiana

Dr. Philip S. Hench, Rochester, Minn., who is preparing a monograph on the work of the U. S. Army Yellow Fever Commission, recently visited the Aristides Agramonte Memorial Library at the Louisiana State University School of Medicine, New Orleans, in order to examine manuscripts and papers of Dr. Agramonte, who was a member of the U. S. Army Commission that demonstrated the transmission of yellow fever by means of a certain species of mosquito. Dr. Hench had just returned from a visit to Dr. Agramonte's daughter in Havana, Cuba.

Syracuse

The new initiates into Alpha Omega Alpha at Syracuse University College of Medicine are William N. Hamblin, Paul Rousseau, Michael P. Rizzuto and Alson F. Pierce, all of the class of 1942, who together with J. Benton Pike and Erwin R. Centerwall, former initiates, comprise the active chapter at Syracuse. This organization will provide a series of programs open to the entire student body and faculty in which members of the local chapter will present scientific papers. At the first of the series for this year on November 13 J. Benton Pike gave a paper on renal hypertension.

Dr. Harry Goldblatt, professor of experimental pathology at Western Reserve University School of Medicine, Cleveland, discussed experimental hypertension, December 9, in the first of a series of lectures sponsored by the local chapter of Nu Sigma Nu medical fraternity and open to the entire student body.

The Harriman scholarship, which is awarded each year to one of the five top ranking students in the senior class, was awarded this year to Paul Rousseau.

"DO YOU KNOW WHAT PHYSICIAN"

Following are answers to the questions appearing on page 2287:

1. Samuel Fuller (1580-1633), who studied medicine in Leyden. Dr. Fuller then practiced in New England until his death in 1633.
2. Dr. James Lloyd (1726-1810), who was born on Long Island, New York, and after a preliminary education in a private school at New Haven was apprenticed in medicine for five years to Dr. William Clark of Boston. He attended lectures on midwifery in London for two years and also acted as a "dresser" at Guy's Hospital in London, where he worked with William and John Hunter. He was in practice in Boston at the time the Revolutionary War broke out.
3. Thomas Thatcher (1620-1678), who also was installed as the first minister of the Old South Church in Boston, Feb. 16, 1670. He was educated for the ministry, according to Dr. Benjamin Spector's book "One Hour of Medical History," volume 5, by Charles Chauncy, the second president of Harvard College, and it is said he probably received his medical education from the same source. In 1677 he issued a publication entitled "A Brief Rule to Guide the Common People of New England how to order themselves and theirs in the Small-Pocks, or Measles."
4. David Livingstone (1813-1873), who studied medicine in London and in 1840 sailed on the first of his great expeditions to Africa. He was absent from England from that year until 1856, again from 1858 to 1864 and again from 1865 until his death at Ilala on Lake Bangweolo in 1873. He made many important geographical discoveries in Africa and was noted for his kindness and tact in dealing with the natives and for the intensity of his desire to open up Africa so that the slave trade might be brought to an end. Among his publications are "Missionary Travels and Researches in South Africa," in which is an accurate account of the tsetse fly disease, and "Narrative of an Expedition to the Zambesi and Its Tributaries, and of the Discovery of the Lakes Shirwa and Nyassa." The well known meeting in Central Africa of Dr. Livingstone with Henry M. Stanley, who had been sent by the New York Herald to find Livingstone, took place in October 1871. The house in which Livingstone was born has been purchased by public subscription to be preserved in honor of this great missionary and explorer.

Book Notices

Essentials of General Surgery. By Wallace P. Ritchie, M.D., Clinical Assistant Professor, Department of Surgery, University of Minnesota Medical School, Minneapolis. Cloth. Price, \$8.50. Pp. 813, with 237 illustrations. St. Louis: C. V. Mosby Company, 1941.

The author admirably succeeded in condensing into a single volume the ever spreading field of general surgery. After a concise but comprehensive discussion of fundamental general problems such as anesthesia, surgical technic and asepsis, the common surgical lesions of different parts of the body, their diagnosis and methods of treatment are described in a masterly manner. No superfluous words are used, yet nothing is omitted that has a bearing on the subject. Although the book has been written primarily for the undergraduate student, it contains enough detail to have an appeal not only to a general practitioner but even to a surgeon who wishes to brush up on the latest advances in his selected field. Several chapters have been written by other members of the staff of the University of Minnesota Medical School, but all are characterized by the same features: brevity, clarity of presentation, easy style, good illustrations. Few errors and omissions of minor importance have been noticed. In the chapter on history of the development of surgery an inclusion of the names of Cushing, Chevalier Jackson and the Mayos would be advisable, because they widened the horizon of surgery in many directions. In the chapter on anesthesia, Luckhardt's name deserves a place because of the popularity of ethylene. "Hypertrophy is enucleated" (p. 724, fifth line from top) is incorrect phraseology, because hypertrophy is a pathologic process and not an organ which can be removed. Not only can the book be unhesitatingly recommended to undergraduate students, but undoubtedly it will make a fine acquisition to the libraries of general practitioners and surgeons as well.

Studies on the Etiology of Gallstones: A Subtilis-Like Bacilli-Group as an Etiologic Factor. By Karl Mårtensson. Akademisk avhandling för erkändelse av medicine doktorsgrad, Stockholm. Acta chirurgica Scandinavica, Vol. LXXXIV, Supplementum LXII. Paper. Pp. 227, with 74 illustrations. Stockholm: Nordisk Rotogravyr, 1941.

This is essentially a report of the results obtained in studies carried out to determine the relationship between bacterial infection and the formation of gallstones. The study was undertaken because it was noted that the center of gallstones was made up of necrotic-like epithelial cells and that, in the walls of gallbladders in which recent formation of stone had taken place, sporulating bacilli occurred intraepithelially and subepithelially with surrounding regions of necrosis and desquamating epithelium.

Considerable space is given to a general consideration of cholelithiasis. The composition and structure of gallstones is reviewed in detail, and a method is presented for analyzing the stroma of the gallstone without injuring possible existent bacteria. A chapter is devoted to the symptomatology and pathology of gallstones. The various theories of the etiology of gallstones are reviewed in detail, and attention is drawn to the possible connection between the formation of gallstones and systemic diseases and between the formation of stones and other disturbances. The literature is extensively reviewed in consideration of the various hypotheses advanced for the formation of gallstones.

Material for culture was obtained from diseased gallbladders removed at operation in 78 cases and at necropsy in 28 cases. A variety of organisms was isolated by this method, but the organism most often found proved to be a gram-positive, mobile endospore-forming rod which the writer chooses to call the "typical bacillus." This "typical bacillus" was recovered from the wall of the gallbladder, the bile, the gallstone itself and the intestinal tract.

The organism discovered and called the "typical bacillus" was thoroughly studied as to morphologic and biologic characteristics, and it was found that it could be divided into three groups, two of which are facultatively anaerobic, one being an obligatory anaerobe. The organism did not fit any previously known bacterium in all its characteristics.

In vitro experiments showed that the "typical bacillus" was capable of causing precipitation of cholesterol when inoculated

on sterile normal human bile. Definite gallstones were produced experimentally in rabbits, swine, sheep and cattle following the inoculation of cultures of this bacillus. All the types of biliary calculi found in man were obtained. "Typical bacilli" were cultured from gallstones experimentally produced, and these organisms when injected into animals were able to give rise to gallstones. The organism was administered directly into the lumen of the gallbladder, intravenously, subcutaneously or orally; all methods were effective in the production of gallstones.

An antigen was prepared with a spore free culture of dead bacilli, and rabbits were thus immunized against the "typical bacillus." In none of these rabbits did biliary calculi develop subsequent to the injection of gallstone producing doses of the bacillus directly into the lumen of the gallbladder. The author expresses the belief that this indicates that the formation of gallstones is affected by the specific antigen of the typical bacillus.

This report is interesting and deserves verification and further clarification by independent workers. The work seems to have been well performed and the results well controlled. The results obtained lend further evidence to substantiate the infectious theory of the formation of gallstones.

A Text-Book of Pathology. Edited by E. T. Bell, M.D., Professor of Pathology in the University of Minnesota, Minneapolis. Fourth edition. Cloth. Price, \$9.50. Pp. 931, with 433 illustrations. Philadelphia: Lea & Febiger, 1941.

This edition follows the same general plan as the earlier editions. The first portion (approximately 40 per cent) is devoted to general pathology, the remainder to special pathology. The text has been increased by thirty-eight pages, and forty-one new illustrations have been introduced.

Certain commendable changes have been made. The chapter on diseases of the urinary system has been thoroughly revised, and Bell's classification of renal disease has been somewhat modified. The discussion of renal diseases remains probably the best to be found in any standard textbook. That portion of diseases of the heart which concerns congenital disorders has been rewritten and remains an excellent chapter. The chapter on diseases of the blood has been written by Bell in this edition but remains essentially the same as formerly presented by Hal Downey except for expansion of certain portions and a shift in emphasis from histogenesis to differentiation of blood cells.

The following criticisms seem worth recording: Although pathologic physiology has received considerable attention in this volume, such disorders as shock, hypovitaminosis, acid base unbalance and uremia receive but little attention. The problem of aging, which is receiving more and more general consideration, is not dealt with here. Bell's general discussion of tumors is excellent: his treatment of specific tumors, however, often includes insufficient histopathology. The general discussion of tuberculosis is probably inadequate for the beginning student. Hypertrophy, hyperplasia and metaplasia are not treated as fundamental processes. In Bell's discussion of edema it is unfortunate that certain outmoded physiologic concepts are retained and that more emphasis is not given to the role of injury in causing increased capillary permeability. Toxic cirrhosis has been inadequately treated, and cardiac cirrhosis is not mentioned. Only five lines are devoted to the general subject of focal necrosis of the liver; four times this much space is spent on cystic degeneration of the same organ. Another example of disproportionate emphasis is encountered in the two and one-fourth page discussion of malaria, in which but five lines deal with morphologic changes.

Worthy of special commendation are gynecologic pathology, diseases of the spleen and the mycoses. In these and other chapters a brief introductory review of histology and physiology is employed to good advantage. The subject of fundamental phenomena of inflammation is well presented by Bell, and his discussion of syphilis is very good. The illustrations are excellent from the point of view of both quality and selection. The bibliography which follows the discussion of each general subject has been well chosen and is particularly valuable because of the explanatory notes which accompany it. This will continue to be a valuable textbook of pathology, probably of greater usefulness to the advanced student, however, than to the beginner.

Über funktionelle Veränderungen der P- und T-Zacken im Elektrokardiogramm: Experimentelle Untersuchungen mit Ergotamin und Amylnitrit, sowie klinische Beobachtungen. Von Olof Nordenfält. *Acta medica Scandinavica. Supplementum CXIX.* Paper. Pp. 186, with 17 illustrations. Lund: Håkan Ohlssons Boktryckeri, 1941.

In this extensive monograph with an English summary the author presents his investigations on the changes in the electrocardiogram due to certain functional disorders. He first reports on the effects of posture change from lying to standing in 49 subjects before and after the injection of 0.5 mg. of ergotamine. This included 14 patients with orthostatic hypotension. In all subjects, but more marked in the orthostatic patients, definite changes in the electrocardiogram appeared. Ergotamine was found to lessen noticeably the postural alterations in the electrocardiogram. This suggested that the action of posture change does not operate through the production of coronary insufficiency but through a direct action on the heart, reflex in origin and sympathicotonic in character. The author then relates his experience with the inhalation of amyl nitrite by 21 normal young persons and by an older person with complete heart block. Again changes in the electrocardiogram were found associated with the cardiac acceleration and drop in blood pressure, changes that resembled those seen in the orthostatic patients on posture change. On this account the author concludes that the mechanism in the two groups is the same.

In the next section he reviews the electrocardiographic changes following exercise carried out on 10 normal persons. The exercise consisted in running up to the point of marked cardiac palpitation. The electrocardiographic changes after exercise were similar to those in the preceding experiments and are again ascribed to an increase in the sympathicotonic state.

The author next reviews the literature on the influence of the autonomic nervous system on the electrocardiogram and then briefly discusses the physiology of coronary vessels. This analysis in the author's mind supports his previous contention of the neurogenic origin of the electrocardiographic changes. Since the vagi appear not to go to the ventricles, the changes seen following vagus stimulation is attributed to a decrease in the sympathicotonic state. Increase in the sympathicotonic state causes cardiac acceleration, a taller P wave especially in leads 2 and 3, a shorter PR, a slight depression of the S-T segment, a marked decrease in the size of the T wave which may become diphasic or inverted and a relative prolongation of electrical systole.

While the argument that coronary insufficiency is not involved in these electrocardiographic changes is supported by the author's experience, the possibility is not excluded in the opinion of the reviewer that the change in autonomic nervous tone may operate by changing the caliber of the coronary vessels rather than, as is suggested, by a direct action on the heart muscle. Nevertheless the view expressed by the author is one well worth considering.

Perhaps the most important contribution of this detailed study is the suggestion that 0.5 mg. of ergotamine given intravenously or subcutaneously may be used to differentiate between the reversible functional electrocardiographic changes and the irreversible ones based on organic disease of the heart. It is now clearly recognized that, in fear and in neurocirculatory disorders of the heart, electrocardiographic abnormalities are found resembling those seen in coronary insufficiency. A more extensive trial of ergotamine as suggested by the author may turn out to be of clinical value in the differential diagnosis. The experience of the author, however, is insufficient to warrant this final conclusion.

Microbes Which Help or Destroy Us. By Paul W. Allen, Ph.D., Professor of Bacteriology and Head of the Department, University of Tennessee, Knoxville, D. Frank Holtman, Ph.D., Associate Professor of Bacteriology, University of Tennessee, and Louise Allen McBee, M.S. Cloth. Price, \$3.50. Pp. 540, with 115 illustrations, including 13 color plates. St. Louis: C. V. Mosby Company, 1941.

This book is another of the popular presentations of bacteriology as it relates to both the infectious diseases and the various phenomena of bacterial etiology that are beneficial to man. The material is soundly and clearly presented in an informal way and should be readily understood and enjoyed by the intelligent layman. The style is somewhat strained in the attempt to popularize, e. g. "our microscopic pals," but, though slightly irritating to the scientist, is perhaps desirable here. To one

trained by systematic study of the bacteria, the organization of the book as a whole seems somewhat confused. For example, a number of chapters intervene between the discussion of water supplies and that of sewage disposal; bacteriophage is discussed in a separate chapter at the end of the book rather than with the viruses; the spirochetes of Weil's disease are widely separated from *Treponema*. Such an illogical development will, of course, be hardly apparent to the layman. Much of the material on the infectious diseases is discussed in terms of particular pathologic conditions. There are, for instance, chapters devoted to the bacteriology of appendicitis, conjunctivitis, boils and carbuncles, tooth infections and the like, all of heterogeneous etiology. Whether such an arrangement is to be preferred in a popular presentation to one of suppurative infections, infections of the upper respiratory tract, the enteric diseases and the like is open to question. In a few instances questionable statements are made; the genesis and development of the epidemic wave, for example, are accounted for entirely in terms of variations in virulence—a belief vigorously expounded by some but for which there is no direct evidence. Questionable statements are rare, however, and neither are serious nor do they detract from the presentation as far as the layman is concerned.

The book is well made and attractively bound. Portraits comprise a large part of the illustrations, and there are thirteen excellent color plates taken from other books issued by the same publisher. The black and white pictures are somewhat below standard, as a rule, but some, such as figures 9 and 10, are superb. The physician will find this book of little value as a source of information because of its elementary nature but may recommend it to the inquiring layman as a clear, accurate and informative discussion devoid of the attempts at sensationalism characteristic of some books of this kind.

Annual Review of Biochemistry. James Murray Luck, Editor. James H. C. Smith, Associate Editor. Volume X. Cloth. Price, \$5. Pp. 692. Stanford University P. O.: Annual Reviews, Inc., 1941.

A book which has been almost indispensable since its inception in 1932 is the Annual Review of Biochemistry. This volume presents the status of certain subjects in the biochemical field in such terms that interest not only by chemists but by practically all laboratory and clinical investigators in almost every field of biologic science is the ultimate response. The present edition reviews the more recent developments in a number of biochemical subjects by offering twenty-four articles which have been written by authorities in their respective fields of endeavor. The topics are biologic oxidations and reductions, proteolytic enzymes, nonproteolytic enzymes, chemistry of the carbohydrates and glycosides, chemistry of amino acids and proteins, the chemistry and metabolism of the compounds of sulfur, carbohydrate metabolism, fat metabolism, the metabolism of proteins and amino acids, the biochemistry of the nucleic acids, purines and pyrimidines, the biochemistry of creatine and creatinine, detoxication mechanisms, hormones, the water-soluble vitamins, fat-soluble vitamins, nutrition, relation of soil and plant deficiencies and of toxic constituents in soils to animal nutrition, mineral nutrition of plants, plant growth substances, spectrometric studies in relation to biology, review of bioluminescence, the chemistry and metabolism of bacteria, biochemical nitrogen fixation and properties of protein monolayers.

It is not possible in a book review to present more than a glimpse of the material contained in such an informative work as this volume. Those who are familiar with past editions will need no urging to peruse the pages of the present edition. Those who have not been very intimate with the companion volumes will be well repaid if they avail themselves of a copy. Members of the medical profession will be especially interested in the sections dealing with the metabolism of fat, proteins and amino acids, detoxication mechanisms, hormones, vitamins and nutrition. For example, in the section relating to hormones there may be found a survey of the present status of thyroxine, the adrenal cortex, progesterone, estrogens, androgens and the anterior pituitary gland. In general, each hormone is discussed under isolation and partial synthesis of derivatives, physiologic effects and assays. As in the past, this edition can be highly recommended as an authoritative treatise on recent developments in biochemistry, and a copy should be available for all lecturers, students and clinical and laboratory investigators.

The Man Who Lived for Tomorrow: A Biography of William Hallock Park, M.D. By Wade W. Oliver. Cloth. Price, \$3.75. Pp. 507, with portrait. New York: E. P. Dutton & Co., Inc., 1941.

This is the biography of a man whose name has been associated with progressive preventive medicine and public health practices for almost fifty years. Dr. William Hallock Park began his career in this field as a member of the New York City Department of Health and there remained for forty-six years before retiring in 1936. As is so often the case with medical men who later become authorities in their respective specialties, Dr. Park had no intention of choosing this career when he graduated; on completing his internship he spent a year of special study in Europe, returning to begin the practice of otolaryngology. Because of a disagreement on the etiology of diphtheria voiced during a social call on Dr. Prudden, Park was invited to work in Prudden's quarters and there demonstrated that the Klebs-Loeffler bacillus is the cause of the disease. At that time this organism was not generally accepted as the responsible agent. This marked the beginning of a career that was to play an important part in public health.

Although many will remember Dr. Park as the first to produce diphtheria antitoxin outside of Europe, others will associate him with general measures on diphtheria control and with studies on cholera, tuberculosis, meningitis, encephalitis, poliomyelitis, pneumonia, whooping cough, streptococcal infections, rabies, tetanus, influenza, typhoid and other infectious hazards to public safety.

Author of recognized textbooks on bacteriology and hygiene and public health, Park's preeminence was cited on Oct. 6, 1936, when the William Hallock Park Laboratory of the New York City Board of Health was dedicated in honor of his retirement as director of laboratories. Among the letters forwarded to Park on this occasion was one from the late Dr. Hans Zinsser, who wrote "Your accomplishments in the introduction of diphtheria antitoxin in this country and in the organization of what was then the model public health and research laboratory in the United States are matters of record, but there are other things you have done which are known only to those of us who were influenced by your example, your advice and your personality. There are many of us—but few who owe you more than I do." Holder of numerous awards and honors, one of which was knighthood bestowed by King Alfonso XIII of Spain, he enjoyed an international reputation that is well described in this biography.

The author is to be congratulated on his practice of frequently quoting from correspondence concerning events which transpired in Park's life. This serves the twofold purpose of emphasizing the work of a leader in public health and of affording interesting and authentic reading in a fashion not commonly found in current biographies. It is a book which is a worthwhile addition to any library, as it presents more than the story of one man's life; it offers interesting sidelights on the development of many of the preventive medicine measures now employed in the United States and elsewhere.

Torch & Crucible: The Life and Death of Antoine Lavoisier. By Sidney J. French. Cloth. Price, \$3.50. Pp. 285. Princeton: Princeton University Press; London: Oxford University Press, 1941.

Lavoisier is best known as "the father of modern chemistry," but he was one of the leading men in his day for other reasons as well. He was formally educated for the law but had more interest in science, especially geology, water supplies and water, with the result that he was elected member of the Academy of Science at the age of 25. In his work with water and gypsum he weighed his materials with the greatest care, a new quantitative procedure that in his hands led to the overthrow of the centuries old phlogiston dogma of combustion and to the introduction of quantitative methods in chemistry, by means of which he discovered the composition of the air and its relation to life. His investigations laid the foundations of chemical physiology. He changed completely chemical thought and nomenclature. We owe the names oxygen and hydrogen to him. But in addition to his epochal achievements in the science of chemistry Lavoisier, always an active citizen with liberal and progressive tendencies, gave much time and energy to work of a public nature. He held membership in the "Tax Farm" (*Ferme générale*) of France and was a member of its committee on

tobacco. When the government took over the powder monopoly Lavoisier became the director of the powder commission and moved his residence and laboratory into the old arsenal of Paris. Here Madame Lavoisier presided with grace and charm over famous dinners. And Lavoisier had a country estate where he made successful experiments in agriculture and endeared himself to the people of the district. In his biography French has succeeded admirably in his attempt "to write in one person the elements which made Lavoisier such a striking figure." He gives us a vivid, absorbingly interesting account of the rise of Lavoisier's family, his personal life, character and career, in science as well as in public service and other relations. A strong light is thrown on the tremendous developments in the background that led to his execution, May 8, 1794, a victim of the revolutionary fury. He was then 50 years old. "It took but an instant to cut off his head; a hundred years will not suffice to produce one like it."

Professional Adjustments. I. By Gene Harrison, A.B., R.N., Educational Director, Druid City Hospital School of Nursing, Tuscaloosa, Alabama. Cloth. Price, \$2.25. Pp. 204. St. Louis: C. V. Mosby Company, 1941.

A student nurse, or better still a prospective nurse, will find this book of the utmost value to her. Based on the extensive experience of the author as a teacher of nurses and director of nursing schools, it deals with the everyday, commonplace matters which, taken separately, are of little consequence but which, added together, may make all the difference between a good nurse and an inferior one. Dealing with such matters as careless habits of speech, neatness and general conduct and discussing rouge, fingernail polish and other matters pertaining to appearance, it relates all these to the fundamental question as to what effect they will have on the character of the nurse and her service to the patients. In the same way the matter of alcohol, tobacco, chastity, personal relationships with fellow students and fundamental honesty of attitude toward hospital, patients, doctors and self are treated in a straightforward, simple, sincere manner which should be of genuine help to any student nurse. This book not only should be read by student nurses but might profitably be reread by some graduates and should certainly be recommended to the girl who looks on nursing as a prospective career. Since the book is intended for use in a course of instruction, it is organized into chapters to each of which is appended a list of suggestions for study and a bibliography for reference reading, as well as one or more pages for personal notes. An inspirational touch is furnished by a brief quotation opposite the opening page of each chapter. There is a good index.

The Baker Memorial: A Study of the First Ten Years of a Unit for People of Moderate Means at the Massachusetts General Hospital. By Haven Emerson, M.D. Cloth. Price, 50 cents. Pp. 75, with 2 illustrations. New York: Commonwealth Fund, 1941.

In 1930 the Baker Memorial Hospital introduced a plan for the hospitalization of middle class patients. The patient day rates were to be between \$4.50 and \$6.50 and the medical bill limited to approximately \$150 for any patient. In the ten years that followed, bed capacity has increased from one hundred and fifty-nine to two hundred and forty-nine and the percentage of occupancy from 54 to 86. The death rate has been about midway between that of the Massachusetts General Hospital and the Phillips House, with which institutions it is affiliated. Massachusetts General cares for charity patients and the Phillips House devotes itself to private patients. A questionnaire to discharged patients brought general expressions of satisfaction as to the treatment received with criticisms mainly confined to administrative details. The average patient payment during the ten year period for all inclusive hospital care was \$119.09 and the average medical fee \$66.06. While the Baker Memorial Hospital shows a small operating surplus, account has not been taken of depreciation or of sums contributed from the resources of the Massachusetts General Hospital. A considerable sum has also been contributed by the Julius Rosenwald Fund. There is no retirement or insurance plan for the administrative or non-professional staff. In view of the gift of \$2,000,000 for the original building and numerous other large gifts to meet deficits, it cannot be said that the Baker Memorial Hospital plan offers a pattern which can be followed generally.

Organic Chemistry with Applications to Pharmacy and Medicine. By Eldin V. Lynn, Ph.D., Professor of Chemistry, Massachusetts College of Pharmacy, Boston. Cloth. Price, \$4.50. Pp. 410. Philadelphia: Lea & Febiger, 1941.

For some years there has been need for a textbook on organic chemistry especially prepared for students who are engaged in the study of organic chemistry as an adjunct to pharmacy and medicine. This volume has been written to fill this need. The subject matter includes that usually found in organic treatises, but most of the material which is only of commercial or theoretical interest is omitted, while that which is of pharmaceutical or medical interest is emphasized. U. S. P., N. F. and N. N. R. products are so designated and their descriptions given, but only cursory reference is given to methods of analytic procedure.

The subject material is well arranged and a sufficient number of formulas and illustrations are given for clarification of the reactions. The organic compounds are divided into forty-four chapters according to chemical structure; the general characteristics of each group are given and important members are described individually. At the end of each chapter there are a number of review questions which deal mainly with reactions and identifications. In the interest of brevity, the descriptions not infrequently assume the character of an outline, which results in a lack of smoothness of presentation.

The book is of especial value to those organic chemistry teachers who have not had training in the medical or pharmaceutical fields and find difficulty in giving supplementary lectures on these subjects. To the student of medicine or pharmacy it is a textbook the contents of which can be studied as a whole without the necessity of omitting portions that are too far afield. Therefore it will be found useful not only as a book for the classroom but also as a reference work.

Health Resorts of the USSR: A Symposium of Articles Compiled from Data of the Central Institute of Balneology in Moscow. Editor: Dr. I. A. Pertsov. Cloth. Pp. 271, with illustrations. Moscow: The U. S. S. R. Society for Cultural Relations with Foreign Countries (V. O. K. S.), [n. d.]

This book leaves the reader in some doubt as to whether it is intended to promote the health resorts of the Union of Soviet Socialist Republics or to extol the October Socialist Revolution. It consists mainly of descriptions of various health resorts in the different autonomous Soviet Republics. These descriptions are almost purely promotional; one searches in vain for true scientific evaluation. For example, with respect to the resort Akhtala, one of the Georgian Soviet Socialist Republic's resorts, occur the following quotations, which are typical of the book:

Exuding from the hills, with a temperature of about 23°, the Akhtala muds have been found to consist of water and solid substances among which plastic clay predominates. The aqueous component of the mud is basically sodium chloride water, also containing carbonates of sodium, calcium, magnesium and so on, its mineralization totaling 16.5 Gm. per liter.

Akhtala mud is administered both in the form of hot baths and by bathing at the mud-mounds. It finds application for the treatment of diseases of the locomotor organs, chronic perigastritis, peridodenitis, hepatitis, perityphlitis, neuritis and neuralgia. These muds are also a remedial for treatment of skin diseases, chronic phlebitis, varicose ulcers, female diseases and other ailments.

Much space is devoted to pointing out the tremendous growth and reconstruction of the "culture and rest" facilities which are claimed to be open to all Soviet workers. The actual capacities and figures given for occupancy during recent years indicate that even yet these facilities are actually open to only a small percentage of those who are theoretically entitled to them.

This book is nothing more than a descriptive listing of Soviet spas with propaganda material for the Soviet political and economic system.

Immunity Against Animal Parasites. By James T. Culbertson, Assistant Professor of Bacteriology, College of Physicians and Surgeons, Columbia University, New York. Cloth. Price, \$3.50. Pp. 274, with 4 illustrations. New York: Columbia University Press, 1941.

The author intends this volume to be of value to those beginning the study of the fundamental principles of immunity in relation to the parasitic forms of life, but he assumes that the reader is well versed in the fundamentals of both parasitology and immunology.

The contents of the book are divided into an introduction and three parts: part one relates to resistance and acquired immunity, part two relates to immunity in specific diseases and part three

discusses applied immunology. In addition there is included a list of the abbreviations of names of periodicals and an adequate index. Part one discusses natural resistance, age resistance, specifically acquired immunity, requisites for immune response, parasites which elicit immunity, mechanisms of specific immunity and demonstrations of immunity; part two describes the immunity from the amebiasis, the leishmaniasis, the trypanosomiasis, the malaria, the coccidiosis, the trematodiasis, the cestodiasis, the nematodiasis and the arthropods and part three contains a classification of parasites, a description of vaccination against parasites and diagnosis of parasitic infection. The index is sufficiently extensive to permit easy reference.

The style of writing and the general makeup of the book are conducive to pleasant reading. Unnecessary details are kept at a minimum. The information contained in this book will be of interest and value to all students of immunity against animal parasites, and the volume can be regarded as an authoritative source for reference. Its availability in all libraries will be appreciated by students and lecturers.

A Laboratory Manual of Physiological Chemistry. By D. Wright Wilson, Benjamin Rush Professor of Physiological Chemistry, University of Pennsylvania, Philadelphia. Fourth edition. Cloth. Price, \$2.50. Pp. 298. Baltimore: Williams & Wilkins Company, 1941.

The book is designed as a laboratory manual for medical, dental and other students taking a general course in biochemistry. It follows essentially the same pattern as the three previous editions, which were reviewed in THE JOURNAL. Obviously the manual has been written primarily to meet the author's own requirements in teaching relatively large classes in biochemistry. Since the general plan remains unchanged, he has undoubtedly found that the book meets these requirements. The right hand page has been left blank for laboratory notes, thus cutting in half the number of apparently printed pages. The manual is confined almost wholly to directions for laboratory experiments, discussion and explanations being reduced to a minimum with the obvious intention of focusing the students' attention on the laboratory experiments. The directions are concise but given in sufficient detail so that they can be followed and understood. In general the course appears to follow the plan introduced by the Chittenden-Mendel school. The methods selected may be called standard methods. The author has been conservative in that the many advances in the field have resulted in few changes in the manual. He has apparently felt that, if the laboratory work furnished the student a sound ground work in the subject, other necessary material could be given in lectures and assigned readings. It is of interest and logical that he should have included carbohydrates, proteins and fats in part I, introduction, along with inorganic constituents, standard acid and alkali, electrolytic dissociation, colloids and alcohols, aldehydes and esters. Part II, which takes up the last two thirds of the book, includes the usual topics covered in biochemistry under the heading of Body Tissues and Fluids. A short discussion of photoelectric colorimetry has been included in this edition.

Basic Problems of Behavior. By Mandel Sherman, M.D., Ph.D. Cloth. Price, \$3. Pp. 440. New York, Toronto & London: Longmans, Green & Co., 1941.

This is a textbook for educators, psychologists and students of the social sciences. It is an elaboration of the author's *Mental Hygiene and Education*, published in 1934. The book aims "to present the clinical, experimental, psychological and psychiatric data of a number of basic problems of behavior." Individual chapters on the emotions, motivation and frustration, theories of personality, common mechanisms of adjustment, measurement of personality, attitudes and conflicts are followed by more clinical chapters on delinquent behavior, the neuroses and "mental abnormalities." The scope of the book is so broad that detailed critical review is here impossible. The author draws on his research and clinical experience and he culls and interprets the extensive literature, publishing a useful and well selected bibliography. The thesis that clinical and experimental observations or evidence can well be combined in the study of behavior is defended, but at times the author's prejudices lead him to turn against this point of view. This is particularly noteworthy in his repudiation of some psychoanalytic concepts which are "accepted on clinical evidence and . . . on com-

mon sense grounds" without "experimental or verifiable evidence" (p. 129). The implication is that psychoanalytic clinical observation is not verifiable. It is understandable, in view of the extensive range the book covers, that at times the discussion seems incomplete or superficial. The book is more authentic in the earlier chapters than in the later discussions of neuroses and psychoses. As an instance the author understates by far, if he at all appreciates, the role of aggression in the neuroses. The discussion of the neuroses is general and somewhat confused. The book will be useful to the general student of behavior as offering an orientation and guidance, particularly with respect to the literature. The medical student or student of psychiatry will find it of more limited usefulness.

Breathing Capacity and Grip Strength of Preschool Children. By Eleanor Metheny. George D. Stoddard, Ph.D., Editor, University of Iowa Studies, Studies in Child Welfare, Volume XVIII, No. 2. Paper. Price, \$1.35. Pp. 207, with 7 illustrations. Iowa City: University of Iowa Press, 1940.

Grip strength, as measured with a hand dynamometer, and "vital" capacity, as measured with a spirometer, are two of the oldest and most popular tests for what is vaguely described as physical fitness. Precisely what is measured in each case and what may be the significance of the measurements are questions still unanswered by the present monograph. It is, however, of value to examine the results of such measurements. Dr. Metheny's book is a critical review of previous work and an exhaustive presentation of findings in 206 children between the ages of $2\frac{1}{2}$ and $6\frac{1}{2}$. Correlations were computed for the relation of grip strength and vital capacity with various anthropometric measurements as well as with "health ratings," "fatigue ratings" and school absences. Values for normals, repeatability and change with growth are presented. Some slight relation between grip strength and "health" was noted, but vital capacity showed no such relation. There was also an indication that a decline in grip strength may precede the appearance of active infection of the upper respiratory tract. The present monograph is a record, in extenso, of meticulous observation and statistical computation. It is not likely to provide stimulating or even very informative reading to the average physician or scientist but should be invaluable to those few investigators who are seriously concerned about the details of simple grip strength and vital capacity tests. We may hope that factors such as the start of infection, which may produce sudden changes in grip strength, will be studied further and presented in more reasonable compass.

Medical Policies and Procedures for the Resident Staff of the Alameda County Hospitals and Clinics. Benjamin Warren Black, M.D., Medical Director of Alameda County. New edition. Cloth. Pp. 123. Oakland, California, 1941.

This manual is well abreast of modern practice, having been revised annually since its first publication in 1936. It is conveniently arranged in loose-leaf form with eighteen chapters covering general hospital information and instruction to the resident staff as regards the admission of patients, laboratory and x-ray service, clinical photography, anesthesia, accidents and emergencies, and the general management of individual clinical departments, including isolation and psychiatry. Suitable reference is made to the use of the sulfonamide drugs, the administration of parenteral fluids, transfusions, vitamin therapy and other special procedures, and a section of twelve pages devoted to the symptoms and treatment of poisoning gives information that is exceedingly valuable to the intern and resident staff. There is likewise a convenient index of medical procedures and a list of the drugs and preparations available in the hospital pharmacy. This handbook of medical and administrative procedures prepared by a physician prominent in the field of hospital administration might well be used as a model for other institutions planning to establish new rules or modify existing regulations appertaining to the house staff.

The Rockefeller Foundation, International Health Division, Annual Report 1940. Paper. Pp. 247, with illustrations, New York, [n. d.].

Each year the International Health Division of the Rockefeller Foundation publishes an annual report with information on the technical side of its work and with references to descriptions of its research work presented in the medical literature. The report is purported to be prepared for the health officer, the

public health student and readers interested in preventive medicine. Of the one hundred and fifty-two references analyzed and reported in the present edition, fifty-two relate to malaria and thirty-two to influenza. The contents of this annual report include an introductory statement covering the general activities of the division, a section on virus studies, a description of work on the control and investigation of specific diseases which include yellow fever, influenza, tuberculosis, syphilis, rabies, malaria, schistosomiasis, hookworm anemia, the common cold, scarlet fever, typhus fever, mental hygiene and nutrition, a summary of aid given to state and local health services, a description of the division's support to public health education, and a detailed account of expenditures. A table of contents together with an exceptionally adequate index provide a source of ready reference to the contents of this report. For a rapid perusal of the activities and studies undertaken by the staff of the International Health Division of the Rockefeller Foundation, this report offers a concise and clear source of reading. While the booklet will mainly appeal to those who are engaged in public health work, it contains many references of such international interest that no one will regret the time spent in passing over the pages.

When to See Your Doctor. By Robert S. Srigley, M.D. Paper. Price, 35 cents. Pp. 44, with illustrations. Columbus: College Book Company, 1941.

This pamphlet contains eight chapters dealing respectively with pneumonia, cancer, appendicitis, intestinal obstruction, diabetes, pulmonary tuberculosis, syphilis and heart disease. These chapters have been reviewed prior to publication by eminent physicians. Nevertheless the reviewer considers the treatment sketchy and inadequate. The title of the booklet, "When to See Your Doctor," taken in conjunction with the table of contents listing eight diseases, implies that only in these diseases does the author recommend seeing the doctor. The approach tends to favor self diagnosis, whereas the patient should be made conscious only of his own experiences which he can readily observe, even though he cannot interpret them. It is difficult to see how this booklet can contribute anything to the average patient's ability to decide when he ought to see his doctor and when he can safely procrastinate in the hope of spontaneous recovery.

A Text-Book of Bacteriology. By R. W. Fairbrother, D.Sc., M.D., M.R.C.P., Director of the Clinical Laboratory, Manchester Royal Infirmary, Manchester. Third edition. Cloth. Price, \$5. Pp. 451, with 6 illustrations. St. Louis: C. V. Mosby Company, 1941.

An introduction to this book has been written by F. E. Colien of Creighton University School of Medicine. The book is divided into three parts. Part 1 concerns general bacteriology and consists of twelve chapters; part 2 deals with systematic bacteriology and considers the specific infectious agents, which are discussed in twenty-two chapters; part 3 concerns general technic, which is considered in three chapters. The author has omitted the word "medical" from the title of this edition, since the book has been used by junior students of bacteriology in faculties other than those of medicine although the author primarily intended it for the medical student. There is no bibliography given, which makes the book useless as a reference guide. The illustrations are good and the tables are concise and very useful to the student in differentiating infectious agents. The book should prove useful to the medical student.

Roentgen Technique. By Clyde McNeill, M.D. Second edition. Cloth. Price, \$5. Pp. 329, with 276 illustrations. Springfield, Illinois & Baltimore: Charles C. Thomas, 1941.

The second edition of this treatise on roentgen anatomy and positioning is clearly designed for the physician, not for the x-ray technician. There has been added even more diagnostic material, and descriptions of technical procedures, which should be performed only by a physician, are a prominent feature. In an admirably concise style the author describes such relatively new x-ray methods as fluorography, body section roentgenography and cholangiography. The present edition also contains a section on fluoroscopy with particular attention to the dangers of this procedure. The methods of fluoroscopic localization of foreign bodies are well described. Pineal localization, pelvic and cephalic measurements, roentgen kymography and bronchography are treated in some detail. The additions and changes have increased the utility of the book. Its greatest value lies in the accurate manner in which x-ray positioning of all anatomic parts is described and illustrated.

Queries and Minor Notes

THE ANSWERS WERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

VITAMINS AND COLDS

To the Editor:—Could you give me some advice regarding the advisability of giving vitamin preparations to industrial workers for the prevention of colds? Has there been any authoritative work done which indicates that any of the vitamins given to large numbers of workers will materially reduce the incidence of infections of the respiratory tract?

M.B., Toronto, Canada.

ANSWER.—Some work has been done on the relation of vitamin A to colds and to other infections of the respiratory tract. None of the other vitamins have been extensively tried, doubtless because there is no reason to suspect that they might be of any value. The evidence so far available shows clearly that administration of vitamin A or vitamins A and D combined has no beneficial effect in reducing the incidence of colds. There is some evidence, but it is not at all conclusive, that the administration of vitamin A, while it does not protect against colds, does seem to lessen the severity of the attacks. The evidence is not conclusive enough to justify any claim that administration of vitamin A would be of benefit in preventing colds or other infections of the respiratory tract.

ABSORPTION AND EXCRETION OF MERCURY

To the Editor:—A man was treated for syphilis over a period of several months with mercury inunction and some mercuric cyanide intravenously. He later suffered first and second degree burns over parts of his upper torso, and he died about twenty hours later. Postmortem examination showed 8 to 10 grains (about 0.6 Gm.) of metallic mercury in his liver and kidneys. He had had no mercury for several months prior to death. I wish to get all the available information as to the length of time mercury will remain in the tissues of the body after treatment is suspended.

H. S. J. Walker, M.D., Mobile, Ala.

ANSWER.—It is unfortunate that more complete data are not furnished as to the amount and dosage of the mercury inunctions and of the injections.

After intravenous mercurial injections the metal not excreted will consist of two parts: (a) the portion still circulating in the blood stream and (b) mercury that is stored. The circulating mercury reaches its peak level within a matter of hours or certainly days after an intravenous injection of the cyanide or of the oxycyanate, so that several months later any residuum would be found only as stored metal in various organs, principally in the kidneys and liver.

With mercurial inunctions, much of the ointment that is rubbed on is never absorbed, as it is only the portion that is rubbed into the hair follicles that is absorbed and of course this only slowly. It is for this reason that the recommendation has always been made with inunctions that the patient should keep rubbing for thirty minutes by the clock. Even then much of the ointment will be left on the skin, and the physician is never sure just how much has been absorbed. Moreover, the absorption after mercury inunctions is much slower than after intravenous injections of a soluble mercury salt.

Cole, Sollmann and Schreiber compared the urinary mercurial excretion after daily intramuscular injections of mercury sodium bromide (5.5 mg. of metallic mercury) with 4 Gm. daily inunctions of strong mercurial ointment (50 per cent of metallic mercury). At the end of the first week excretion of mercury in the inunction patients was one-half that in the patients on injections. At the end of the second week the level of excretion was about the same. At the end of four weeks excretion in the inunction patients was twice as much. This indicates the slow absorption of the fine globules of mercury from the hair follicles. So that excretion in an inunction case continues at a high level for at least a week after therapy is stopped and in 1 case there was a daily excretion of 0.3 mg. fifty days after all inunctions had been stopped.

However, these are small amounts, and it is understood that the patient in question had had no treatment for several months prior to death.

It certainly would not be possible for a man to live and go about his daily duties for several months with 8 to 10 grains of metallic mercury in his body. Lomholt (Quecksilber, Theoretisches, Chemisches und Experimentelles, *Handb. d. Haut- und Geschlechtskr.* 18:1, 1928) thinks that the saturation of

mercury that may be reached in the body without harm would be around 100 mg. (less than 2 grains). It would seem that some other source must be looked for to explain such a large amount of mercury as was found in this patient.

References:

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Sollmann, Torald; Schreiber, Nora E., and Cole, H. N.: Excretion of Mercury After Clinical Intramuscular and Intravenous Injections, *ibid.* 32:1 (July) 1935.
Sollmann, Torald; Cole, H. N., and Schreiber, Nora E.: Mercury Inunctions, *ibid.* 32:242 (Aug.) 1935.

SULFANILAMIDE DERIVATIVES AND URINARY CRYSTALS

To the Editor:—Is there any drug which may be given a patient with bronchiectasis who is taking sulfathiazole that will prevent the appearance of crystals in the urine? Edward K. Disney, M.D., Tucson, Ariz.

ANSWER.—The appearance of crystals in the urine of a patient who is receiving sulfapyridine, sulfathiazole or sulfadiazine is not of special significance unless the crystals are accompanied by microscopic or macroscopic hematuria. It is to be remembered that in patients receiving moderate to large doses of one of these drugs the urine is liable to be saturated or even supersaturated with the drug, and hence crystals may be seen in freshly voided specimens of urine. If such saturated specimens of urine are placed in the cold, as almost always takes place in hospitals where the early morning urine specimen is placed in an ice box and allowed to remain there for several hours before being examined, crystals of the acetylated or free form of the drug can almost always be found and of course are of little significance. Recently, Schwartz and his co-workers (*THE JOURNAL*, Aug. 16, 1941, p. 514) have reported that the administration of sodium bicarbonate in amounts equal to that of the drug (sulfathiazole) being prescribed reduced the number of instances in which crystals appeared in the urine and also, apparently, the number of crystals of this drug in the urine. While it is not a good practice routinely to administer sodium bicarbonate with sulfapyridine, sulfathiazole or sulfadiazine, it would appear from the work of Schwartz and his associates that under certain conditions the maintenance of high alkalinity of the urine will decrease the amount of crystals in it.

PROBLEMS IN TREATMENT OF SYPHILIS IN FAMILY

To the Editor:—A man aged 32 has been found to have neurosyphilis, probably a brain gumma, with a history of primary infection seven years ago; he took a few treatments and then got married. He has a child 6 years old, another 3 years and another 8 months. A Wassermann test on the mother shortly before the 8 months baby was born was 4 plus (taken elsewhere); she received a few treatments before the child was born. Wassermann tests on the mother now are negative; so are they on the 8 months child and the 3 year old child. The 6 year old child is 4 plus. How can one account for this and what procedure should I take? Of course the mother should have a spinal fluid Wassermann test, but should the two negative children? Should these three be treated anyway or should one wait a while and take more Wassermann tests? If to treat them, how should it be done? Should one start the 6 year old girl on neosarsphenamine, sulfarsphenamine or bismuth and mercury preparations? The father is on iodides and a bismuth preparation now. After a course of this, it was felt that he should have fever therapy, probably by malarial inoculation. Would this be the proper procedure to follow in his case? This man also gave a transfusion one year ago to a 10 year old girl suffering with acute osteomyelitis. A Wassermann test taken by this girl now is 4 plus. Her osteomyelitis has never satisfactorily cleared up, and could this not be the reason? Also what treatment should one start her on? M.D., Iowa.

ANSWER.—In regard to the mother: The fact that her serologic reaction is positive and her oldest child also has positive serologic tests indicates, of course, that she has syphilis. The other two children apparently do not have syphilis, if there is no clinical evidence of the disease in them and their serologic tests are negative. Not every child born of a syphilitic mother necessarily has syphilis; in fact, about one half of the children born to syphilitic women will not have the disease. This can best be explained by the fact that *Spirochaeta pallida* did not pass through the placenta to the fetus, probably because the mother had developed a latent phase of syphilis and had few, if any, spirochetes in her blood stream. It does not seem necessary to make a spinal fluid examination of the two negative children, but it would be advisable to repeat the serologic tests of the blood at six month intervals for several years. The mother and the oldest child should have spinal fluid examinations.

The two younger children do not need treatment unless they should manifest in the future signs of or a positive serologic test for syphilis. The mother and child should be treated by

the so called continuous system with mapharsen and a bismuth compound, the mother to receive increasing doses of mapharsen from 0.01 to 0.04 Gm at five to seven day intervals for eight injections, while the child is given the same drug with dosage of from 0.005 to 0.02 Gm. The bismuth course should follow the mapharsen 1 cc being given four days to the mother and 0.5 cc to the child for a series of sixteen injections of bismuth, at the completion of this, the second course of mapharsen may be started. This program is continued until four courses of mapharsen and six courses of bismuth have been given.

The treatment of the father is dependent on the response he manifests clinically as well as in the spinal fluid to chemotherapy. If after a fair trial that is two courses of an arsenphenamine and bismuth, improvement is not obvious, fever therapy should receive serious consideration.

The osteomyelitis may or may not be of syphilitic origin, and the child's infection may be either congenital or acquired. A decision in this regard is impossible on the data presented and might require further examination. Not infrequently a syphilitic osteomyelitis will fail to heal under antisyphilitic treatment because the bony sequestrum remains and acts as a foreign body. An x-ray examination following antisyphilitic treatment should determine whether a sequestrum is present and whether its surgical removal is indicated. If the child has not been treated she may be placed on a program as just outlined for the child with syphilis.

NONTROPICAL SPRUE

To the Editor—What is the treatment at the present time for nontropical sprue and how does the disease vary from the tropical form? I have been using reticulogen and a fat free diet, but I cannot seem to stop the gradual weight loss which is occurring. Are any of the bile salts of use in the disease?

M D, New York

ANSWER—Tropical or endemic sprue is a chronic afebrile diarrhea occurring in rather limited tropical or subtropical areas and characterized by interference with intestinal absorption resulting in chronic starvation and wasting. The basic pathologic condition is one of nutritional deficiency gradually producing functional and then organic changes. The original deficiency is conditioned by other interwoven deficiencies, by infection and by various physiologic factors, such as in the endocrine system. The peculiar endemic distribution is unexplained. The classic symptomatic and clinical pathologic features rest primarily on a state of chronic starvation.

Nontropical sprue differs in having a nonendemic distribution, usually a more serious course and prognosis, a greater tendency to hemorrhage and much greater resistance to treatment methods which are highly effective in true or endemic sprue. Many consider the two conditions identical. Many others believe they are closely related, perhaps overlapping in etiology, but sufficiently distinct to constitute two different syndromes. Neither has an exact and invariable clinical picture, and in neither are exact pathognomonic criteria of diagnosis available.

Endless discussion goes on as to the relation of sprue to nontropical sprue, celiac disease, chronic pancreatitis, combined system disease of the cord, pellagra and pernicious (Addison-Biermer) anemia.

The principles of treatment in nontropical sprue are the same as for endemic sprue. They may be outlined as follows:

- 1 Diet should omit all sugar and reduce starch to a minimum. It should be primarily high in protein. N. H. Fairley's formula starts with a food ratio of protein 1, fat 0.3 and carbohydrate 1.3. With improvement this is gradually increased to protein 1, fat 0.36 and carbohydrate 2.0. Free use should be made of ripe bananas, banana flour, strawberries, whole fresh milk or goat's milk, beef juice and rare beef and such fruits as papaya if available.
- 2 Unconcentrated (old) liver extract should be given intramuscularly 5 to 10 cc daily for twenty to forty days.
- 3 When hydrochloric acid is decreased in the gastric juice, diluted (U. S. P.) hydrochloric acid should be given 4 cc in a glass of whole milk with each meal.
- 4 Vitamins B₁, B₂ and D should be given in large quantities by mouth. If ascorbic acid is below normal in the blood, it should be given, 25 to 50 mg, in the vein.
- 5 Calcium should be supplied as dicalcium phosphate or basic calcium triple phosphate, 12 Gm daily by mouth. Kaolin and bismuth subcarbonate may be added for severe diarrhea.
- 6 For flatulence, hot stupes, very hot baths and repeated small doses of castor oil (2-4 cc) can be used.
- 7 Mild sedatives are often needed. Iron preparations such as iron and ammonium citrates 0.5 Gm thrice daily are often needed to complete cure of the anemia. Repeated blood transfusions are often most beneficial. Bile salts are used in moderate dosage in the hope of improving intestinal absorption.

CHRONIC MYELOGENOUS LEUKEMIA AND PREGNANCY

To the Editor—A primipara aged 38, married sixteen years, has a normal menstrual history of five day duration with but little pain. There have been no miscarriages. She is a heavy set type about 5 feet 5 inches (165 cm) tall and has a normal weight of 138 pounds (62.6 Kg). Her past history is essentially negative. In April 1939, she had an ulcer on the anterior aspect of the left tibia. After several office treatments without improvement a biopsy was made and the pathologist reported a cutaneous cancer. This cancer was removed by the paste method the wound apparently has healed, and there do not seem to be any bad effects. In June 1941, fifteen months later, the patient noticed that her feet were swelling and that she had considerable abdominal distress. She also complained of being tired and described her condition as a sort of indigestion, which lasted for several months. In September, about four months later, a swelling occurred at the point of the navel. After her physician observed this for several days, he diagnosed an abscess, which he opened in the office. Immediately a severe hemorrhage occurred. As it was impossible to control the bleeding at the office, the patient was taken to the hospital and given an anesthetic. Many sutures were put in the abdominal wall around the incision to get the bleeding stopped. The perplexing question as to why the patient should bleed so profusely arose at once, and, after a careful examination and blood checking it was found that she was suffering from splenomyelogenous leukemia. Immediately roentgen treatments were administered to the spleen, and various blood counts were taken from time to time. The treatments have considerably reduced the white blood cell count. The patient has been taking a liver-stomach concentrate with iron and vitamin B complex by mouth, as well as liver hypoderemics, and a general improvement has been noticed in her condition. She feels well and does all of her home work. About a year later, April 15, 1941, was the last day of her normal menstrual period and she received several roentgen treatments of the spleen at this time. In May and June, when she did not menstruate, she was advised by the doctor who gave her the roentgen treatments that it was probably the treatments that had caused the cessation of the menses. After missing two periods she came to my office, June 15, 1941, weighing 141 pounds (64 Kg), the blood pressure 125 systolic and 70 diastolic, the Kolmer and Kahn reactions negative, the urine normal and much pleased with her general well being. I found her pregnant. She asked me if a pregnancy would have any bearing on a splenomyelogenous leukemia. In August the blood pressure and urine were normal and she had a 4 pound (1.8 Kg) increase in weight but was still feeling fine. When she plays golf or exerts somewhat she has a pinkish vaginal discharge, and, of course, she was advised to give up golf and be more careful. On August 14 (four and one half months after her normal menstrual period) she felt motion for the first time. The question of treatment of the patient and the prognosis are perplexing. Should the patient be given a chance at normal labor provided she has a normal course to the time of expectancy or should she have a cesarean section performed a short time before expectancy? Will continued roentgen treatment, which seems to be necessary to keep the white blood cell count down, cause unfavorable reaction to the fetus, and will it have any effect on the well being of the fetus? Would the administration of snake venom, vitamin K, congo red or the like be of any benefit to the patient before labor?

G C Bates, M D, Independence, Kan

ANSWER—In chronic myelogenous leukemia of this type, pregnancy may be allowed to proceed to its normal termination with the expectancy of a perfectly normal child. If roentgen treatment is given during pregnancy the child may be adversely affected, although there is a possibility that it may escape injury. In this case the fetus was between 4 and 6 weeks old when 120 roentgens were given, presumably over a remote region. It is probable that no damage was done, although it is impossible to predict absolutely. Roentgen therapy should be avoided and should not be given just because the leukocyte count is moderately high (25,000 to 50,000). Pregnancy alone, apparently, does not affect the course of the chronic form of the disease adversely, but the disease may be aggravated by premature termination of the pregnancy. The main problem is hemorrhage during delivery. Bleeding in chronic myelogenous leukemia is due mainly to the inadequate clot formation as a result of the excess of leukocytes. This condition is not influenced by the ordinary hemostatics but responds only when the leukocyte count is reduced by roentgen therapy before delivery. If the count can be reduced by treatment over the chest or spleen, the desired result may be obtained but the child may be injured. The same danger of hemorrhage is present, however, when cesarean section is attempted. Prophylactically, transfusions of 500 cc of human serum may be given intravenously just before delivery. If it is necessary to give intensive roentgen therapy during the course of the disease, the pregnancy must be terminated prematurely.

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Rollston, Humphry. The Harmful Effects of Irradiation (X Rays and Radium). *Quart J Med* 21:101 (Oct) 1930.

POSSIBLE LATE MENOPAUSAL SYMPTOMS

To the Editor:—A woman in her sixties, long past the menopause, says that she has had "hot flashes" several times a day for the last thirty years. These attacks are becoming more frequent and are preceded by a period of profound depression. The latter is more distressing to the patient than the hot flashes. There are no positive physical findings. Is there anything beside estrogenic hormones, which I am trying, that would make the vasomotor system any more stable?

George C. Christie, M.D., Canon City, Colo.

ANSWER.—While the duration of the vasomotor symptoms of the menopause, like their severity, is variable, such symptoms are rarely troublesome beyond a period of a few years, but in diminishing form they may continue longer. The term "hot flashes" refers to the hot, tingling sensations which often involve the whole body. The much more frequent "hot flushes" involve chiefly the head, neck and upper thorax, and it is possible that it is these of which the patient complains. There is general agreement that the entire group of vasomotor symptoms, including the characteristic sweats with the two already mentioned, is brought about by withdrawal of the estrogenic ovarian secretion, with consequent disruption of the reciprocal relations between ovarian and pituitary function. Aside from other evidence, symptoms of a second menopause have been noted in old women after the removal of the estrogen-producing granulosa-cell types of ovarian tumor (Novak, Schulze, Dworzak).

Moreover, it is now known that estrogen is produced in the bodies of at least a proportion of postmenopausal or even castrated women. The exact source of this production is not known, but the evidence points to one of the other endocrine glands, probably the adrenal cortex. In any event, such estrogen production in women well beyond the menopause might be expected to bring about phases of ovarian-pituitary disharmony not unlike that characterizing the menopause.

In the management of such cases, it is of prime importance to eliminate other possible causative factors. Chief among these is the neuropsychogenic element which so often confuses the picture of the normal menopause. It must be remembered too that somewhat similar vasomotor symptoms may occur in hyperthyroidism and in cases of so-called vasomotor instability. If practicable, studies of the vaginal smear and of the estrogenic and gonadotropic content of the urine may throw light on the problem in this case. The fact that the patient in question has apparently not responded to estrogenic treatment would suggest that they may not be of endocrine origin. On the other hand, perhaps the dosage has been insufficient. Menopausal symptoms of moderate severity would ordinarily be alleviated by doses of 10,000 international units given intramuscularly two or three times a week for from one or two to three or four injections. While other plans of treatment, such as irradiation of the ovary and hypophysis, have been suggested, they are, in the opinion of most gynecologists, associated with some hazard and are often ineffectual. For discussions of the general subject of menopausal therapy, including a consideration of dosage and routes of administration of estrogen, the possible hazards of overtreatment and the use of such nonhormonal estrogens as diethylstilbestrol, the correspondent may be referred to the following among many publications:

Novak, Emil: Management of the Menopause, *Am. J. Obst. & Gynec.* 40: 589 (Oct.) 1940.

Shorr, Ephraim: The Menopause, *Bull. New York Acad. Med.* 16: 453 (July) 1940.

RED BLOTCHES OF SKIN IN CONGESTIVE HEART FAILURE

To the Editor:—Recently I have had several patients with congestive heart failure who in the last few weeks had small red blotches over the body. They began as small areas and rapidly increased in number and size. The patients died soon after. The condition might be called morbus maculosus. Could you tell me what the underlying cause is, increased venous blood pressure, increased permeability of the capillaries or changes in the carbon dioxide and oxygen in the blood?

Elmer E. Kottke, M.D., Des Moines, Iowa.

ANSWER.—It is uncommon for congestive heart failure to be attended during the last few days or weeks of life with macular skin lesions such as those described. No one consulted has been willing to attribute such lesions to congestive heart failure per se. Purpura can sometimes be terminal, that is, in the last few hours of life, especially in the presence of abnormalities of the blood or of the blood vessels when increased permeability of the capillaries may be largely blamed. Of course, in conditions such as subacute bacterial endocarditis or active rheumatism, cutaneous lesions are not uncommon, but they are not merely terminal and they are not primarily due to congestive heart failure. Hence the presence of red blotches over the body in the presence of congestive heart failure demands a search for some cause other than the heart disease and failure themselves.

HEMORRHAGE, SHOCK AND NIKETHAMIDE DOSAGE

To the Editor:—Can you tell me whether there is danger from an overdose of nikethamide in the agonized patient? A woman apparently in agony received caffeine and nikethamide subcutaneously one hour after the transfusion of 300 cc. of blood and 1,000 cc. of 5 per cent dextrose solution. Later I gave her nikethamide slowly intravenously. As long as the drug was being administered, the pulse and the respiration remained fairly good, although consciousness was not regained. After 6 ampules had been given I stopped the administration of nikethamide because (1) it apparently prolonged agony without returning the patient to consciousness and (2) I was afraid of an eventual overdose. Soon the patient died. There was a bleeding ulcer of the duodenum, confirmed by autopsy. Can you tell me whether agony in itself, loss of consciousness, exophthalmos, deep, suffocated breathing and small quick pulse is a reversible condition, and how long it is reversible? Does it represent irreparable damage of the cortex of the brain or not? The postmortem examination of the patient, which showed the bowels full of blood, raises the third question: As all life-saving measures tend in themselves to raise blood pressure and increase bleeding, do you think it advisable to operate on such a patient? When the patient entered the hospital the hemoglobin content was 50 per cent.

M.D., Oregon.

ANSWER.—There is little danger of overdosage of nikethamide as the toxicity is low and the substance is rapidly detoxified in the body. Overdosage is conditioned not only on the size of the dose but on the rapidity with which the drug is given. The drug carries its own warning signal, as it becomes a convulsant before the lethal dose is approached.

The patient probably had a peripheral vascular collapse. When this occurs there is a deficient return flow to the heart. This deficient return flow comes about (1) when blood escapes from the vessels, (2) when plasma escapes into the tissues and (3) when the arteriolar bed dilates or blood collects in the viscera. In this case there was probably a combination of escape of blood from the hemorrhage from the ulcer and collection of blood in the viscera from a dilatation of the arteriolar bed. The result would be a tremendous fall in blood pressure and a diminished cardiac output. The hypotension and deficient cardiac output are accompanied by a deficient cerebral and coronary blood flow. If the blood flow in the cerebral and coronary circulation is deficient over a long enough time irreparable damage ensues and the condition is irreversible. If the collapse is overcome either by restoration of the vasomotor tone or by control of the hemorrhage, before irreparable damage ensues, the patient recovers. In cases of severe collapse it is often impossible to tell from the clinical symptoms whether the condition is reversible. In this case it seems fair to assume that the vasomotor tone was partially restored but the blood loss continued.

The question of operation requires the exhibition of most critical judgment. As a general proposition, the presence of shock or peripheral collapse is a contraindication to operation. Surgical shock added to peripheral collapse is likely to be fatal. It is conceivable that if bleeding were known to be going on and its source were known an attempt to stop the hemorrhage might be made. It seems more than likely that in the situation described the patient would have succumbed in any event.

SPASMODIC TORTICOLLIS

To the Editor:—Can you give me the consensus as to the operative results of section of the eleventh cranial nerve for so-called functional spasmodic torticollis? My patient has had severe spasms for the past four or five months. He has been examined by two neurologists, who agree that it comes under the heading of "functional spasmodic torticollis." Does simple crushing of the nerve as is performed in a temporary phrenic nerve paralysis offer any value?

M.D., New York.

ANSWER.—Since the cause of any one particular instance of spasmodic torticollis is seldom determined, adequate treatment may be lacking, and, in fact, any treatment of this condition may be and frequently is of little effect. That it may actually be on an organic basis and follow encephalitis, striatal disease or myositis seems entirely tenable. However, in most instances the condition is believed to be on a functional basis, and by far the larger number of such patients are helped by intelligent psychotherapy. Since in the usual case of torticollis many more muscles than the sternocleidomastoid are involved, it is not sufficient to cut the accessory nerve alone to arrest the spasms. This procedure has, by and large, been marked with failure, and crushing the nerve would not be recommended as either rational or useful. Some surgeons have, with moderate success, cut the posterior roots of the upper cervical cord, together with the accessory nerve on the involved side. Others have gone so far as to cut the anterior and posterior roots of the cervical cord, together with the accessory nerve on both sides, thereby destroying all efferent and afferent pathways of the cervical musculature. Then, of course, the neck could not be moved even by a hysterical person, but such radical surgery would seem to be

rarely if ever recommended. Operative results for spasmodic torticollis are poor, psychotherapy is the best means of treatment of the usual patient with this complaint, many cases will not respond to treatment of any kind.

SUBLUXATION OF RIB FROM LIFTING AND ABDOMINAL PAIN

To the Editor—While lifting a 90 pound roll of wire, a white man aged 35 suddenly experienced a severe pain in the back just to the right of the spine, over the twelfth rib. The past medical history is negative, there had been no previous back injury, and the patient is accustomed to handling objects weighing as much as 200 pounds. The pain was immediately relieved with diathermy but returned one hour later and required opiates. Twenty four hours later he had sudden severe epigastric pain with generalized boardlike rigidity of the abdomen. Roentgenograms of the chest and abdomen were negative, roentgenograms of the thoracic spine revealed a slight separation of the twelfth right rib from the spinal attachment, the white blood count was 13,000 with 90 per cent polymorphonuclears, the temperature was 100.8 F, urinalysis was negative, the blood Wassermann and Kahn reactions were negative, and the pulse was 72, full and regular. In view of the history of injury it was decided to treat the patient conservatively, and the following day his condition remained unchanged with the exception of occasional emesis of undigested food and bile, his morning white blood count was 20,000, dropping to 10,000 by evening. Infusion of 5 per cent dextrose solution was followed by a chill and a temperature of 104 F. Three hours later his temperature dropped to 100 F, and the pain and rigidity disappeared from the abdomen. The following morning the patient was comfortable except for pain in the back, and he has continued to improve daily. Surgical consultation was called with the development of the epigastric pain, and the surgeon felt that there was probably a coincidental perforated ulcer which had sealed off. I should like to know whether the rapid improvement of abdominal symptoms is compatible with such a diagnosis and whether this severe epigastric pain could be due to an injured intercostal nerve or a diaphragmatic injury even though the roentgenograms of the diaphragmatic area were negative.

M D, Iowa

ANSWER—After consideration of the evidence given in this case there is no hesitation in stating that such a train of symptoms as detailed in the report could not come from a subluxation of so small a joint as the twelfth rib. The patient might have a little local tenderness which would last a varying length of time, but the other symptoms would not be present. This man probably had one of three conditions in the abdomen. 1 A perforating ulcer is possible which sealed itself over. In a flat chested man with the liver pressed closely down over the duodenum one of these perforations can be shut off and walled in with great rapidity. 2 If the patient had a barrel shaped chest, one would have to seek another explanation. In this type of individual one would suspect an acute cholecystitis with an obstruction of the cystic duct of a ball valve type which relaxed and permitted a free flow of bile, thus relieving the symptoms. 3 The third possibility would be an acute appendicitis of an obstructive type in which the obstruction is relieved and the inflammatory mass empties into the bowel. Either of the conditions detailed in 2 and 3 could give the symptom complex as shown in the report. The speed of repair and convalescence following 2 and 3 would be far more rapid than in 1.

THERAPY OF HYPOPARATHYROIDISM

To the Editor—A woman who had a thyroidectomy about five years ago has received oral calcium and parathyroid since the operation. Without the calcium she quickly develops signs of hypothyroidism with tetany. For the past two months the parathyroid has not seemed to work, and it has been necessary to give calcium intravenously in order to maintain the blood calcium anywhere near normal. Calcium gluconate intravenously in her case does not give as complete relief from symptoms as calcium chloride intravenously, which is being used at present. This, of course, reduces the heart rate to less than 50 at the time of administration. The patient also has hypertension and chronic gallbladder disease. I should like to know as to the advisability of continuing the use of the intravenous calcium chloride over a long period of time, whether or not it is contraindicated, and any suggestion as to therapy if it becomes necessary to discontinue this form of therapy.

J F Rommel, M D, Oneida, N Y

ANSWER—The therapy of hypoparathyroidism is now simple and satisfactory. The intravenous administration of calcium salts is no longer necessary except in an acute emergency. Then calcium gluconate is preferable to calcium chloride, since it is less irritating. Dihydroxycholesterol is capable, when administered by mouth, of raising the serum calcium value to normal and thus of overcoming most of the symptoms of hypoparathyroidism. One usually starts with 5 mg of this substance daily for about five days and later reduces the dosage to 5 mg three times a week. The only danger to keep in mind is the possibility of producing hypercalcemia. This danger has been overemphasized in the past, however. It may be guarded against by doing rough tests for calcium in the urine with the use of the Sulkowitch reagent. Further details are given by Fuller Albright (Note on the Management of Hypoparathyroidism with Dihydroxycholesterol. *THE JOURNAL* June 24, 1939, p 2592).

PROBABLE SCLEROSING OSTEITIS OF GARRE

To the Editor—A man in his thirties who was operated on one year ago for acute osteomyelitis of the femur has suffered from furunculosis for years. He states that *Staphylococcus albus* was isolated. At present he has a discharging sinus on the upper outer side of the thigh which necessitates the wearing and changing of daily dressings. At present the roentgenograms show fusiform thickening of the cortex of the upper third of the left femur just below the lesser and greater trochanters, more evident at the site of the lesser trochanter. This fusiform swelling is due to some irregular bone formation derived from the outer portion of the cortex and the periosteum. No evidence of sequestrum or cavities is seen. The findings indicate a chronic osteomyelitis of long standing. I have curetted the walls of the sinus and removed a valvlike membrane which obstructed the opening. The sinus is 1½ inches long. I packed it with sterile sulfanilamide daily for a week. At present I am packing the sinus with a drain saturated with azochloramid in olive oil 1:2,000 every four days. The discharge at present is seromucous. I should like to know how this sinus can be healed.

M D, New Bedford Mass

ANSWER—From the description of the roentgenograms it would seem that this condition might be due to an osteitis known as the sclerosing nonsuppurative type originally described by Garre. However the name is misleading for sometimes osteitis of this kind does break down and suppurate and drainage occurs but usually there is no sequestrum. If there is a sequestrum it is small. If there is no sequestrum and no central bone abscess in this case (which should be apparent in the roentgenogram if present), it might be well to try swabbing out the sinus every day with a solution of equal parts of phenol (carbolic acid) and tincture of iodine being careful to protect the skin edges with an alcohol pad while this is being done. Sometimes this solution will destroy the granulating tissues and scarify the sinus tract causing the walls to collapse and adhere and thus close the tract. If treating the condition in this manner every day for ten days or two weeks does not result in improvement the treatment should be discontinued. One might also try injecting the sinus tract with a solution of sulfathiazole and sesame oil. Sufficient sulfathiazole should be put in the sesame oil to produce a thick paste solution which can be injected into the sinus. This should be repeated daily for several weeks.

There is no royal road to the healing of sinuses due to osteomyelitis. The main point is to be certain that there is no dead bone present for if there is treatment will not produce results. Sequestrums must be removed or work their own way out.

PAINFUL PAROXYSMS OF JAW

To the Editor—A housewife aged 45, who has been known to have diabetes for the past eight years, has been taking insulin for only three months. 50 units daily and has the diabetes well controlled. About two months ago she had a set of dentures made and complained of no trouble until three weeks ago. Then suddenly she experienced excruciating pain in the lower jaw on taking the first bite at mealtime. The pain is bilateral and around the angle of the jaw, it does not radiate and is described as a severe shooting sensation. She has to grab her jaw with both hands until the sensation subsides. After the momentary pain subsides she can eat the remainder of the meal in comfort. Oddly enough fluids also produce the pain, which is not related, apparently to motion at the articulation, thus she gets the pain on taking orange or tomato juice, but milk, tea and coffee produce no ill effects. I sent her to a dentist to ascertain what role the new dentures might be playing as a cause of such pain. He thought that pressure on the long buccal nerve might be the cause and on infiltration with procaine hydrochloride the patient had complete though temporary relief. Accordingly the dentures were filed down to alter the bite somewhat, but the patient continues to look forward to each meal with dread because the pain continues unabated. I find this case so unusual that I write to ask your opinion and suggestions.

M D, New York

ANSWER—The data presented are not sufficient to permit a diagnosis in this case. The painful paroxysms are not typical of trisfacial neuralgia, and the diabetes probably has no direct etiologic bearing. While a change in the dental bite resulting from the dentures may have produced some alteration in the temporomaxillary articulations it is not likely that this has any direct bearing.

The character and distribution of the pain suggest a muscle spasm or a transitory obstruction of the parotid ducts. The latter is supported by the fact that fruit juices, which tend to stimulate profuse secretion of saliva induce the pain whereas bland fluids do not. It is possible that trauma or irritation to the meatuses of Stensen's ducts attributable to the dentures may have a direct causative effect.

In all probability the painful paroxysms will disappear spontaneously in the course of time, and leaving the dentures out for a while is likely to hasten this.

LOCALIZED YELLOW DISCOLORATION OF SKIN AND AMENORRHEA IN YOUNG WOMAN

To the Editor:—A young woman aged 17, well nourished and healthy looking, ceased to menstruate three years ago. All laboratory analyses were made and nothing abnormal was found; the blood chemistry was somewhat increased. Examination of the heart, lungs, pelvis and so on revealed no abnormalities. Psychically she seems somewhat deviated from the normal; there are spells of melancholy and excited states. She has had much estrogenic therapy by mouth and enterically with heavy dosage but so far to no effect. Her mind is much disturbed by the fact of menstruation not appearing. She has a peculiar icteric discoloration of the skin of the hands and feet only. The skin of the rest of the body is clear, as is the sclera of both eyes. There are no clay colored stools. Can you help me as to the cause of the color of the skin of her hands and feet and the probable cause of her lack of menstruation? The estrogenic products were of different reliable manufacture.

M.D., Iowa.

ANSWER.—It is presumed that the usual liver function tests have been performed and have failed to reveal liver damage. There is a possibility that the peculiar discoloration in this case is due to carotenemia rather than to a derangement in the liver or gallbladder. In cases of carotenemia there is rarely any discoloration of the conjunctiva but the change is localized elsewhere. Some obese women who are on a rigid diet eat an excessive amount of carrots and develop carotenemia. If this is true in this case, carrots should be omitted from the diet. Even if the patient is not consuming large amounts of carrots, it may be advisable to omit them for a while.

It is unfortunate that the tests failed to reveal any specific abnormality, because most likely in this case the persistent amenorrhea is due to some general disturbance. Estrogen therapy may produce bleeding but it will not be periodic unless the treatment is carried out repeatedly. This, of course, is not true menstruation. More logical therapy for the amenorrhea is the use of pituitary preparations or gonadotropic hormone from mare's serum, but both of these preparations yield successful results in only a small proportion of amenorrheic women.

YEAST INFECTION OF VAGINA IN PREGNANCY

To the Editor:—A patient pregnant about six months showed on antepartum examination a yeast infection of the vagina. There are always thick chunks of cheesy material present which, on microscopic examination, show the yeast organisms. I have treated the patient with compound solution of iodine and methylrosaniline with no result. Could this yeast infection produce a serious infection during the puerperium? How long do you think I should continue local treatment in this case? As a rule, I do not touch the vagina, if possible, during the last weeks of pregnancy. This patient otherwise is healthy. There is no sugar in the urine. Could you advise me what to do to get rid of this infection?

Ludwig Gruenewald, M.D., Sheboygan, Wis.

ANSWER.—Yeast infections of the vulva and vagina are more common in pregnant women than in the nonpregnant. In some pregnant women the condition persists despite treatment but disappears spontaneously soon after delivery. It may, however, reappear later. There need be little fear about puerperal infection arising from the yeast infection. Nevertheless the condition should be treated even during the last few weeks of pregnancy to give the patient relief from itching and other symptoms. In nearly all cases, temporary benefit can be obtained by thorough application of 1 to 2 per cent solution of methylrosaniline to all parts of the vulva and vagina. This treatment should be carried out every second day for four or five times or until the discharge and its symptoms disappear. In some cases element iodine as found in 0.5 to 0.25 strength compound solution of iodine or 0.25 to 0.20 strength tincture of iodine is helpful.

SLOUGHING FROM SCLEROSING SOLUTIONS

To the Editor:—On two occasions after the injection of sodium morrhuate into a vein on the leg of a young unmarried woman there was a leakage into the surrounding tissues. Is this due to any peculiar porosity of the vein or is this drug more likely to filter through than some of the other drugs employed? Can you refer me to any literature bearing on these points?

M.D., Massachusetts.

ANSWER.—Perivenous infiltration or necrosis occurs following the injection of sclerosing solutions when the tip of the needle slips out of the vein or when the wall of the vein is infiltrated with the solution. Occasionally, however, a small area of sloughing may occur at a considerable distance from the site of injection, at a point where the wall of the vein is thin and closely adherent to the skin. In the presence of small, thin walled intracutaneous varicosities it is safer to use a 50 per cent dextrose or a 10 per cent sodium chlorite solution, because more active solutions may produce a necrosis of the wall. Further safeguards against sloughs following the injection treatment are the employment of fine, 23 to 25 gage, needles with

short bevels, a free flow of blood on aspiration and a continuous watch for edema or blanching around the vein during the injection. If the perivenous injection is promptly stopped and the area around the vein is infiltrated with procaine hydrochloride, physiologic solution of sodium chloride, or the patient's own blood, a cutaneous necrosis may often be averted.

A pamphlet of the American Medical Association on varicose veins, reprinted in 1940, gives more detailed information on the subject. It can be obtained on application.

MEDICINAL USES OF FLAXSEED

To the Editor:—Does flaxseed tea, used over a period of weeks or months, in amounts of 2 cups a day, have any irritating gastric effect, such as nausea or injurious action on the bowel? Does it leave an acid residue? I have been unable to find the answer to these questions in any books available to me. Can you advise where I might get a satisfactory treatise on flaxseed and its medicinal actions?

L. C. Mudd, M.D., San Francisco.

ANSWER.—Flaxseed, a synonym for linseed, is said to have the properties of a demulcent and emollient because of the mucilage and oil it contains. Although an infusion has in the past enjoyed varying popularity in the therapeutics of the respiratory and urinary tracts, present evidence indicates that any therapeutic value of linseed probably is confined to its use as an emollient poultice and as a demulcent. The daily use of dilute solutions of flaxseed "tea" should not cause any gastrointestinal irritation. It does not leave an acid residue. Sources of information on the Linum, U. S. P., and Linaceae (flax family) are:

Second Supplement to the Pharmacopoeia of the United States of America (U. S. P. XI, 1939 Supplement).
Mansfield, W. W.: *Materia Medica, Toxicology and Pharmacognosy*, St. Louis, C. V. Mosby Co., 1937.
Youngken, H. W.: *A Textbook of Pharmacognosy*, Philadelphia, P. Blakiston's Son & Co., 1936.
The Dispensary of the United States of America, Philadelphia, J. B. Lippincott Company, 1937.

The last named publication contains the following pertinent statement on the use of flaxseed: "There is a popular notion that the mucilaginous substances can be absorbed from the alimentary tract and exercise an internal demulcent action, and an infusion made by treating the whole seeds with boiling water is widely employed in catarrhs of the respiratory or urinary tracts. But as the gums, like other carbohydrates, are affected by digestive juices, no benefit is to be expected from such a use of the drug."

REPAIR OF THORACOTOMY WOUNDS

To the Editor:—Would you be kind enough to refer me to any articles on the plastic surgical repair of old deforming thoracotomy wounds?

Joseph L. Gaster, M.D., Brooklyn.

ANSWER.—A satisfactory article dealing with this subject has not been found. Plastic repair of deforming, completely healed thoracic wounds is rarely undertaken, partly because they may be covered by clothing and partly because the depression produced by the loss of ribs cannot adequately be overcome. Ugly, broad, depressed scars resulting from the healing of infected wounds may be excised, the extracostal muscle layer freed from binding scar tissue, and the muscles and skin sutured in separate layers. Primary union and a considerable improvement in the appearance of the wound may be expected if the suturing has been accomplished without tension.

Deforming, unhealed thoracic wounds, in the depth of which the lung and bronchial fistulas are exposed, present a complicated problem. When the lung is not the site of residual infection and when there is little or no wound discharge or sputum, the defect may be closed by pedicled grafts of muscle or skin. When infected, such closure cannot be effected until the pulmonary infection has been overcome either by the adequate drainage of residual abscesses, by the removal of bronchiectases by lobectomy or by other means.

VITAMINS AND DEAFNESS

To the Editor:—In the Oct. 25, 1941, issue of *The Journal*, page 1491, there is an answer to a question headed "Vitamins and Deafness." The answer contains a quotation at some length of comments made by Dr. George E. Shambaugh Jr. but leaves out an interesting discussion by H. E. Harris and P. R. Moore of the Grile Clinic, which appeared in the *Medical Clinics of North America* 24:533 (March) 1940. This discussion gives a quite different view of the subject than do the comments quoted from Shambaugh. I should like to point out also that I have never claimed that vitamins would completely restore loss of hearing caused by deafness due to eighth nerve involvement.

Grant Selfridge, M.D., San Francisco.

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DEPARTMENT, JULY-DECEMBER, 1941

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Acta chirurgica Scandinavica. Stockholm.
Acta medica Scandinavica. Stockholm.
Acta obstetrica et gynecologica Scandinavica. Stockholm.
Acta medica URSS. Moscow.
Acta orthopaedica Scandinavica. Copenhagen.
American Heart Journal. St. Louis.
American Journal of Cancer. New York.
American Journal of Clinical Pathology. Baltimore.
American Journal of Digestive Diseases. Fort Wayne, Ind.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. Cincinnati.
American Journal of Orthopsychiatry. Menasha, Wis.
American Journal of Pathology. Ann Arbor, Mich.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. New York.
American Journal of Public Health. New York.
American Journal of Roentgenol and Radium Therapy. Springfield, Ill.
American Journal of Surgery. New York.
American Journal of Syphilis, Gonorr. and Venereal Diseases. St. Louis.
American Journal of Tropical Medicine. Baltimore.
American Review of Tuberculosis. New York.
Anais brasileiros de ginecologia. Rio de Janeiro.
Anales de la Cátedra de patología y clínica de la tuberculosis. Buenos Aires.
Anales de la Facultad de medicina de Montevideo.
Anales de la Sociedad de puericultura de Buenos Aires.
Anesthesiology. New York.
Annales pédiatriques. Basel.
Annali d'igiene. Rome.
Annals of Internal Medicine. Lancaster, Pa.
Annals of Otolaryngology, Rhinology and Laryngology. St. Louis.
Annals of the Rheumatic Diseases. London.
Annals of Surgery. Philadelphia.
Archiv für Dermatologie und Syphilis. Berlin.
Archiv für Gynäkologie. Berlin.
Archiv für japanische Chirurgie. Kyoto.
Archiv für Kinderheilkunde. Stuttgart.
Archiv für klinische Chirurgie. Berlin.
*Archives of Dermatology and Syphilology. A. M. A., Chicago.
Archives of Disease in Childhood. London.
*Archives of Internal Medicine. A. M. A., Chicago.
*Archives of Neurology and Psychiatry. A. M. A., Chicago.
*Archives of Ophthalmology. A. M. A., Chicago.
*Archives of Otolaryngology. A. M. A., Chicago.
*Archives of Pathology. A. M. A., Chicago.
Archives of Physical Therapy. Chicago.
*Archives of Surgery. A. M. A., Chicago.
Archivos argentinos de pediatría. Buenos Aires.
Archivos argentinos de fisiología. Buenos Aires.
Archivos de la Clínica e Instituto de endocrinología. Montevideo.
Archivos latino americanos de cardiología y hematología. Paseo de la Reforma, México, D. F.
Archivos uruguayos de medicina, cirugía y especialidades. Montevideo.
Arkhiy Biologicheskikh Nauk. Leningrad.
Bihla medica. Bahia, Brazil.
Beiträge zur Klinik der Tuberkulose. Berlin.
Beiträge zur klinischen Chirurgie. Berlin.
Bibliotek for læger. Copenhagen.
Boletín del Instituto de medicina experimental para el estudio y tratamiento del cáncer. Buenos Aires.
Boletín de la Oficina sanitaria panamericana. Washington, D. C.
Boletín de la Sociedad cubana de pediatría. Havana.
Bollettino. Milan.
Boletines y trabajos, Academia argentina de cirugía. Buenos Aires.
Brain. London.
British Heart Journal. London.
British Journal of Children's Diseases. London.
British Journal of Dermatology and Syphilis. London.
British Journal of Experimental Pathology. London.
British Journal of Ophthalmology. London.
British Journal of Radiology. London.
British Journal of Surgery. Bristol.

British Journal of Tuberculosis. London.
British Journal of Urology. London.
British Medical Journal. London.
Bulletin of the Health Organization of the League of Nations. Geneva.
Bulletin of the Johns Hopkins Hospital. Baltimore.
Bulletin of the Naval Medical Association. Tokyo.
Bulletin of the New York Academy of Medicine. New York.
California and Western Medicine. San Francisco.
Canadian Medical Association Journal. Montreal.
Canadian Public Health Journal. Toronto.
Cancer Research. Baltimore.
Cardiologia. Basel.
Chirurg. Berlin.
Clinica. Bologna.
Clinica ostetrica e ginecologica. Rome.
Connecticut State Medical Journal. Hartford.
Cuore e circolazione. Rome.
Delaware State Medical Journal. Wilmington.
Der deutsche Militärarzt. Berlin.
Dermatologica. Basel.
Deutsche medizinische Wochenschrift. Leipzig.
Deutsche Zeitschrift für Chirurgie. Berlin.
Deutsches Archiv für klinische Medizin. Berlin.
Edinburgh Medical Journal.
Endocrinology. Springfield, Ill.
Folia Pharmacologica japonica. Kyoto.
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Gann. Tokyo.
Gazzetta degli ospedali e delle cliniche. Milan.
Geneeskundig tijdschrift voor Nederlandsch-Indië. Batavia.
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Giornale italiano di dermatologia e sifilologia. Milan.
Glasgow Medical Journal.
Hospital. Rio de Janeiro.
Illinois Medical Journal. Chicago.
Indian Medical Gazette. Calcutta.
Irish Journal of Medical Science. Dublin.
Journal of Allergy. St. Louis.
Journal of the Arkansas Medical Society. Fort Smith.
Journal of Aviation Medicine. St. Paul.
Journal of Bone and Joint Surgery. Boston.
Journal of Clinical Endocrinology. Springfield, Ill.
Journal of Clinical Investigation. New York.
Journal of Experimental Medicine. New York.
Journal of the Florida Medical Association. Jacksonville.
Journal of Hygiene. London.
Journal of Immunology. Baltimore.
Journal of the Indiana State Medical Association. Indianapolis.
Journal of Industrial Hygiene and Toxicology. Baltimore.
Journal of Infectious Diseases. Chicago.
Journal of Investigative Dermatology. Baltimore.
Journal of the Iowa State Medical Society. Des Moines.
Journal of the Kansas Medical Society. Topeka.
Journal of Laboratory and Clinical Medicine. St. Louis.
Journal-Lancet. Minneapolis.
Journal of Laryngology and Otolaryngology. London.
Journal of the Maine Medical Association. Portland.
Journal of the Medical Association of the State of Alabama. Montgomery.
Journal of the Medical Association of Georgia. Atlanta.
Journal of the Medical Society of New Jersey. Trenton.
Journal of Mental Science. London.
Journal of the Michigan State Medical Society. Muskegon.
Journal of the Missouri State Medical Association. St. Louis.
Journal of the National Cancer Institute. Washington, D. C.
Journal of Nervous and Mental Disease. New York.
Journal of Neurology and Psychiatry. London.
Journal of Neurophysiology. Springfield, Ill.
Journal of Nutrition. Philadelphia.
Journal of Obstetrics and Gynecology of British Empire. Manchester.
Journal of the Oklahoma State Medical Association. Oklahoma City.
Journal of Pathology and Bacteriology. Edinburgh.
Journal of Pediatrics. St. Louis.
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Journal of the Philippine Medical Association. Manila.
Journal of Physiology. Cambridge.
Journal of the Royal Army Medical Corps. London.

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- Journal of the South Carolina Medical Association. Florence.
Journal of the Tennessee State Medical Association. Nashville.
Journal of Thoracic Surgery. St. Louis.
Journal of Urology. Baltimore.
Kekkaku. Tokyo.
Kentucky Medical Journal. Bowling Green.
Klinicheskaya meditsina. Moscow.
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Lancet. London.
Laryngoscope. St. Louis.
Maandschrift voor kindereneeskunde. Leyden.
Mededeelingen van den dienst der volksgezondheid in Nederlandsoh-Indie. Batavia.
Medical Annals of the District of Columbia. Washington.
Medical Journal of Australia. Sydney.
Medicina. México, D. F.
Medicine. Baltimore.
Medizinische Klinik. Berlin.
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Military Surgeon. Washington, D. C.
Minerva medica. Turin.
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Mitteilungen aus der medizinischen Akademie zu Kioto. Kioto.
Monatsschrift für Geburtshilfe und Gynäkologie. Basel.
Monatsschrift für Kinderheilkunde. Berlin.
Münchener medizinische Wochenschrift. Munich.
Nagasaki Igakkai Zasshi. Nagasaki.
Nebraska State Medical Journal. Lincoln.
Nervenarzt. Berlin.
New England Journal of Medicine. Boston.
New Orleans Medical and Surgical Journal.
New York State Journal of Medicine. New York.
New Zealand Medical Journal. Wellington.
Nordisk medicin. Stockholm.
North Carolina Medical Journal. Winston Salem.
Northwest Medicine. Seattle.
Note e riviste di psichiatria. Pesaro.
Ohio State Medical Journal. Columbus.
Okayama-Igakkai-Zasshi. Okayama.
Ophthalmologica. Basel.
Oto-rino-laringologia italiana. Bologna.
Pennsylvania Medical Journal. Harrisburg.
Physiological Reviews. Baltimore.
Pollinicco (sezione medica e pratica). Rome.
Practitioner. London.
Prensa médica argentina. Buenos Aires.
Presse médicale. Paris.
Psychiatric Quarterly. Utica, N. Y.
Psychoanalytic Quarterly. Albany, N. Y.
Public Health Reports. Washington, D. C.
Quarterly Journal of Medicine. Oxford.
Quarterly Journal of Studies on Alcohol. New Haven, Conn.
Radiology. Syracuse, N. Y.
Review of Gastroenterology. New York.
Revista argentina de neurología y psiquiatría. Rosario de Santa Fe.
Revista de la Asociación médica argentina. Buenos Aires.
Revista de cirugía de Buenos Aires.
Revista clínica española. Madrid.
Revista de gastro-enterología de São Paulo.
Revista de higiene. Bogotá.
Revista médica brasileira. Rio de Janeiro.
Revista médica de Chile. Santiago.
Revista médica del Hospital general México, D. F.
Revista médica latino-americana. Buenos Aires.
Revista médica de Rosario. Rosario de Santa Fe.
Revista mexicana de cirugía, ginecología y cáncer. México, D. F.
Revista neurológica de Buenos Aires.
Revista de tuberculosis del Uruguay. Montevideo.
Revue belge des sciences médicales. Louvain.
Rhode Island Medical Journal. Providence.
Rivista di patologia e clinica della tubercolosi. Bologna.
Rivista di patologia nervosa e mentale. Florence.
Rocky Mountain Medical Journal. Denver.
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Sei-I-Kai Medical Journal. Tokyo.
South African Medical Journal. Cape Town.
Southern Medical Journal. Birmingham, Ala.
Southern Surgeon. Atlanta, Ga.
Southwestern Medicine. El Paso, Texas.
Sovetskaya meditsina. Moscow.
Sperimentale. Florence.
Surgery. St. Louis.
Surgery, Gynecology and Obstetrics. Chicago.
Taiwan Igakkai Zasshi. Taihoku, Formosa.
Texas State Journal of Medicine. Fort Worth.
Tokyo Igakkai Zasshi. Tokyo.
Tubercle. London.
Ugeskrift for læger. Copenhagen.
Vestnik khirurgii. Leningrad.
Vestnik oftalmologii. Moscow.
Virginia Medical Monthly. Richmond.
Vrachebnoe delo. Kharkov.
War Medicine. Chicago.
Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.
West Virginia Medical Journal. Charleston.
Wiener klinische Wochenschrift. Vienna.
Wiener medizinische Wochenschrift. Vienna.
Wisconsin Medical Journal. Madison.
Yale Journal of Biology and Medicine. New Haven.
Zeitschrift für die gesamte Neurologie und Psychiatrie. Berlin.
Zeitschrift für Kinderheilkunde. Berlin.
Zeitschrift für klinische Medizin. Berlin.
Zeitschrift für Urologie. Leipzig.
Zeitschrift für urologische Chirurgie. Berlin.

SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "SS," Student Section; "ab," abstracts; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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 Am—American
 A—Association
 Coll—College
 Conf—Conference
 Cong—Congress
 Conc—Concussion
 Dist—District
 Hosp—Hospital
 Internat—International
 M—Medical
 Med—Medicine
 Nat—National
 Pharm—Pharmaceutical
 Phys—Physicians
 Rec—Recreation
 Ry—Railway
 Soc—Society
 Surg—Surgery
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